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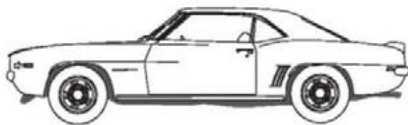
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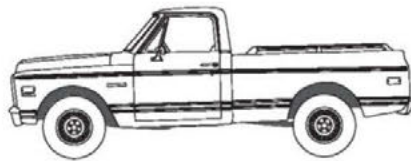
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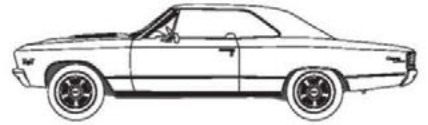
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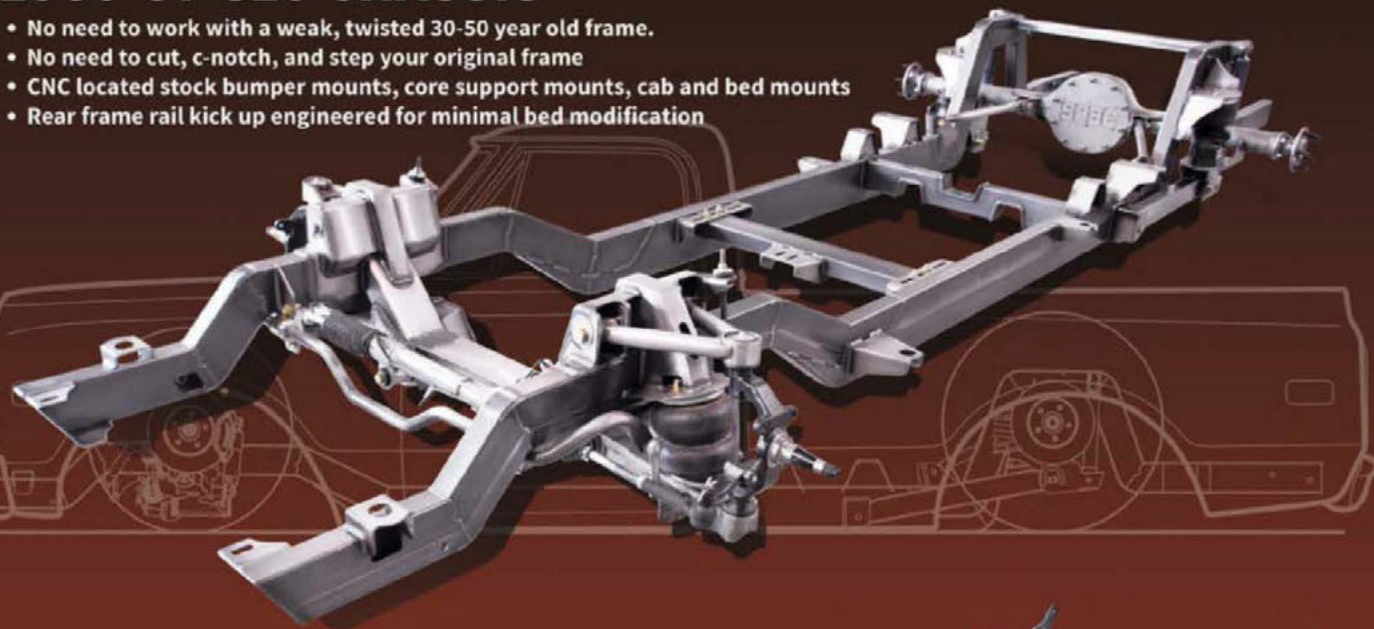
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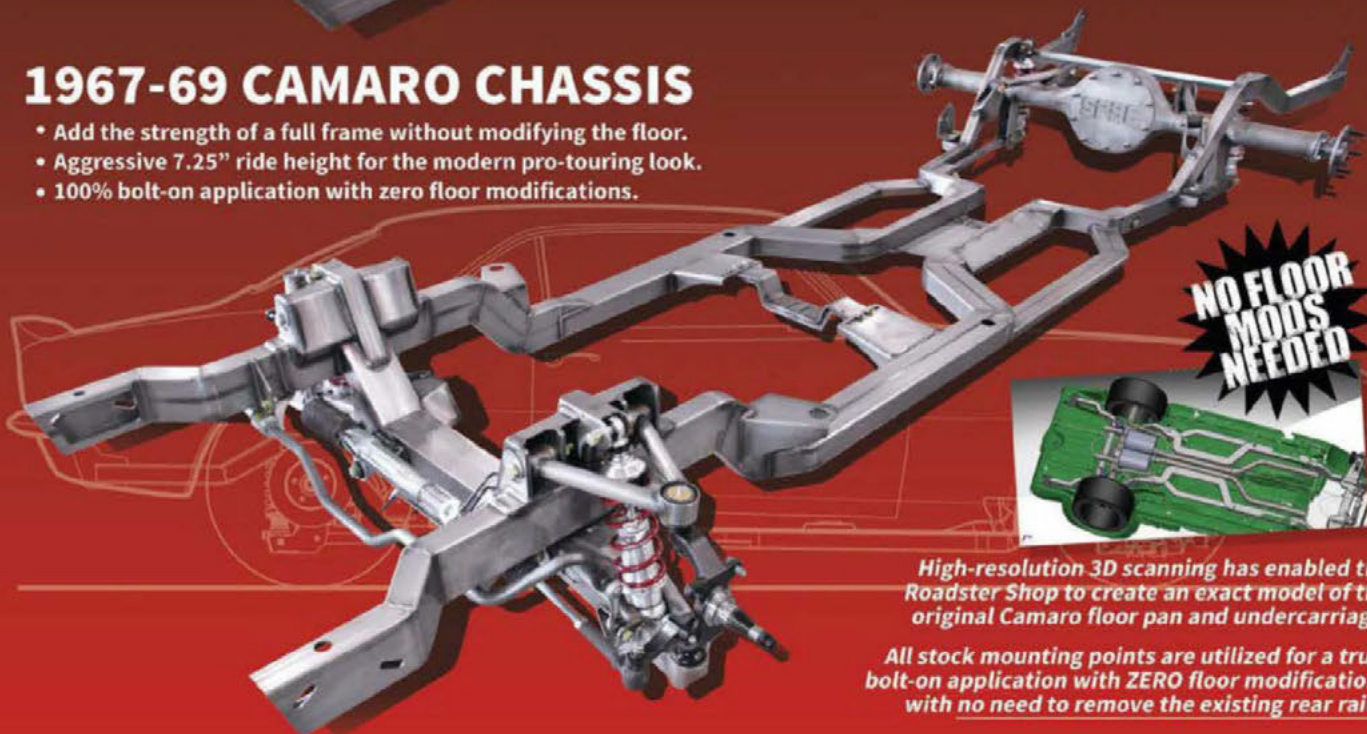
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# CONTE

CHEVY HIGH PERFORMANCE MAGAZINE ✱ MAY 2016

## FEATURES

- 20 THE BULL SEES RED**  
Mike Norcia's ProMod Street Camaro
- 38 GET WHAT YOU NEED**  
Drake Kelley's Scare-O-Meter Chevelle
- 62 THE DARK HORSE**  
Once a fake Yenke, this '68 emerged  
the super car it never was meant to be

## TECH

- 28 A PERFECT RECIPE - PART 1**  
Building big power is easy when you  
have the right parts and a good plan—  
lots of cubes and boost helps, too
- 44 PICKING THE CORRECT CARB**  
Experts suggest the best choices  
for five basic engine combos





# ENTS

## » ON THE COVER

The recent incarnation of Pro Street muscle cars seem to have morphed into a more functional build style for guys who prefer that radical look. Mike Norcia's 1967 Camaro carries plenty of old-school attitude with a reliable big-block for power. Check out the feature starting on page 20.

Photo by **Robert McGaffin**

## **52 A TALE OF TWO CHEVYS - PART 2**

Topping our short-blocks

## **68 LOSE WEIGHT AND GAIN STRENGTH**

This bolt-in 1993-'02 F-body front suspension system has everything necessary for improved timeslips

## DEPARTMENTS

### **6 FIRING UP**

Build it your way, it's all subjective in the end

### **10 FIRING BACK**

You said it, we print it

### **16 STRAIGHT LINE SPOTLIGHT**

The baddest drag racing Chevys

### **76 PARTS BIN**

Things you need for your Chevy

### **80 JUST SAYIN**

Guest columnist Ro McGonegal shares what it was like to be in deep on drag tests for a 1970 1/2 Camaro Z28

## » TOC

Back in the day, Drake Kelley's 1964 Chevelle gasser was a real-deal C/Altered drag car. It still carries decade's-old pits and patina it earned while racing, and then sitting in a SoCal barn and horse corral for decades.

Take a trip back to a much different era of hot rodding starting on page 38.

Photo by **Robert McGaffin**



# FIRING UP

Nick Licata NLicata@enthusiastnetwork.com



## Land of the Free, Home of the V-8

**The beauty of hot rodding** is the fact that everyone has his or her own idea of what is “right” when it comes to building a muscle car or hot rod. Be it engine combination, manual or automatic transmission, exterior paint scheme, or wheel and tire combination.

For many Chevy enthusiasts, an LS engine is the way to go due to its reliability and ability to make gobs of streetable horsepower all the while pulling down decent gas mileage in the process. Well, that’s fine for those guys, but there are still many who find that the old-school architecture of the small- and/or big-block works just fine, thank you very much.

a manual trans is fun and all, but you just can’t beat an automatic for consistent e.t.’s at the strip. On the flip side, when it comes to autocross or road racing, I’d have to say manual is the way to go. With that said, there are major advancements happening today with automatic transmissions, which are now able to provide plenty of engine braking to help bring a car

“What looks good to you may not be what the next guy likes, and that’s the beauty of hot rodding—it’s 100 percent subjective.” ★

Is either technology right or wrong for motivating a classic Chevy? I suppose that depends on whom you talk to and what day it is. I equate it to trying to figure out which Rolling Stones album is my favorite. It’s certainly going to be one from the Mick Taylor years (1969-1974), but for some reason, I keep changing my mind among *Let It Bleed*, *Exile on Main St.*, and *Sticky Fingers*. Talk about a conundrum ... But, enough about Mick and the boys.

A lot of guys/gals are convinced three pedals is the way to go when building a muscle car, but have you ever tried to get consistent times at the dragstrip with a manual transmission? If you can win in True Street with a manual trans, you are my hero. Don’t get me wrong, drag racing with

down from speed when diving into an apex, but I actually love driving a car equipped with a manual trans and doing all the work that goes along with it, but that’s just my personal preference.

Now, when it comes to wheel and tire combinations, the choices are pretty much limitless, especially when you are talking about wheels. For the most part, I’m a five-spoke kinda guy. The closer to traditional, the better. They just seem to work on any build style and look good on just about every muscle car rolling down the road—early- or late-model—as long as they are sized proportionately to the car or truck they are on. Nineteen-inch wheels may look good on a truck or late-model hot rod, but to me they are pushing it when it comes to bolting

those onto a first-gen Camaro. But again, it’s all personal preference, and if one guy likes 20s on his ‘68 Camaro, then so be it. It’s just not my cup of PG Tips.

When it comes to paint, I’m not one for flames or crazy graphics on my cars. I always thought first-gen Camaros benefit from the SS, Bumble Bee nose stripe, or Hockey stripes. They do a good job of breaking up the monotone paint scheme and offer up a bit of period-correct nostalgia. I also think Tri-Fives look cool with the classic two-tone paintjob just as long as the colors work well together.

There’s no doubt we all have opinions on what we think looks cool, but like I said, what looks good to you may not be what the next guy likes, and that’s the beauty of hot rodding—it’s 100 percent subjective.

Just remember, the guy who passed you on the highway sporting 20-inch chrome wheels and 30-series rubber on his second-gen Camaro may be thinking your car looks totally outdated as you cruise 60 mph in the slow lane on 15-inch slotted rims and BFG T/A radials at 4,000 rpm. Yes, I know the M22 Rock Crusher you have is period-correct, pretty much indestructible, and cool as hell, but it may be time to look into an overdrive—a Gear Vendors ought to do it.

You in?





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# FIRING BACK

✦ By **Nick Licata**

## 🔴 SHOW US WHAT YA GOT

Nick,

A definite “yes” on getting rid of engine covers. If you can’t figure out a way to make an engine look like it should, maybe we’re all better off if it’s just covered up. One problem is the lack of any height at the intake manifold. Modern engines in vintage cars just get lost down in the engine compartment hole when they are virtually flat across the top at the valve covers.

One additional thing. I’m no prude, but Mary Pozzi’s potty-mouth article at the end of the mag, besides being poorly written, is just a shame to see. It seems that we continue to go down the path of less and less civility and decent taste in all things. I’m not sure why it’s necessary to use inappropriate language to try to make a point (and don’t tell me it’s because of the guy being remembered). Journalism is supposed to be about being able to write well and make your points without resorting to a “shock jock” mentality.

**Chuck Johnston**

*Via email*

I do not like engine covers. I want to see the engine. On LS engines, I want to see the mechanicalness of that engine and not plastic covers or fake big- or small-block valve covers. If you like the look of a big-block, put a big-block in it!

**Edward Hall Jr.**

Nick,

Couldn’t agree more.

**Robert Blanch**

*via email*



Nick,  
Great editorial in the January 2016 issue. I share your thoughts about engine covers. As a 1969 Plain Jane Camaro owner (not



Z/28/SS/RS car), I hang my hat on a Trans Am/NASCAR engine vibe with a custom cowl-induction airbox. Your insight is dead on.

**Gary Conrad**

*Bexley, OH*

## 🔴 COVER UP MONSTROSITY

Nick,

Feel free to use any of this muse as you see fit. I did not want to send a general email because I am going to slam someone’s idea of cool. That is just not good taste to call someone out in front of thousands of people for work they did that they think is cool. I would call a friend out in private. I will cover that subject later.

As I read your Firing Up column in the January 2016 issue regarding engine covers, I was in step with you—in full agreement, don’t care if it’s a Ridler car—show the beauty of the engine and don’t cover it up! Then I came across the 1969 Camaro on page 62 in the January 2016 issue. From the tacked-on sheetmetal on the cowl to the aluminum tacked on

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## FIRING BACK

the stock spoiler, to the God-awful aircleanerenginecovermonstrosity. What were you thinkin'? So, I look at the air cleaner with thin-wall conduit fittings screwed all over it "actually acting as supports," and I think "What am I lookin' at?" I go back and read your engine cover piece. And I'm thinkin' "Did he miss it? How could an editor who just wrote the piece allow this tuner monstrosity into the mag?"

Then I start thinking about the

Firing Back column in November 2015 issue. Several slams about your direction, cancelling subscriptions, etc. When I read that I was afraid this was your swan song. I have mostly the same slams, but I'm not giving up the subscription. Peaks and valleys, that's the way I look at it. But if the valleys (tuner Camaros) last too long, I might not be able to wait for the peaks to come back.

And so we are clear; if the Camaro



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guy was a friend, we would have had a serious talk before I let him do that to his car. If I want to see tuner, I will look for that mag, not *CHP*. I just looked at that air cleaner again when I was writing this. OMG! I hope you just missed it and this is not an attempt to take *CHP* down. Please don't miss another one.

Thanks for the opportunity to give my opinion.

**Dan Burgess**  
Morris, IL

## ROLLING WITH THE CHANGES

I am 66 years old and have been involved in hot rodding since I was 11 years old. Being a welder by profession, I worked 17 years building Winston Cup engines, hard-faced Billet camshafts, welded aluminum heads for 36 years, and I've built and worked on numerous street







cars. I feel the LS-type engines are great, but personally I like the old small-blocks and big-blocks in older cars. I also really like the inline-sixes. I see the LS platform as the way hot rodding is going. I even remember when the flathead was replaced by the small-block. What I'm getting at is hot rodding changes and people have to accept it. The main thing is that the combination should be what the owner likes.

I like your magazine and feel that ya'll do a good job!

Sincerely,  
**Jim Presnell**  
via email

## ⊙KEEP THE BUDGET BUILDS

Hello Mr. Licata,  
Your introduction article asked for our input, so here is mine.  
I, and I suspect many other



readers, would appreciate a larger dose of "budget build" type articles. Not all of us can spend \$100k on a toy. Although I am not, many readers are younger folks, and what better way to promote their interest in this hobby than help them locate viable, affordable options to build their dream on a Home Depot paycheck. Your more mature readers are tapped out from paying for their kids' college and weddings. I fall into the latter category. Here

is an image of my current build in which I have less than \$8k in, so I know it can be done ... With your help, of course.

Thank you,  
**Jim Connolly**

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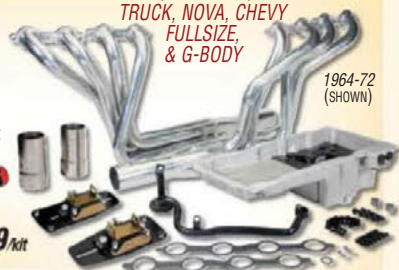
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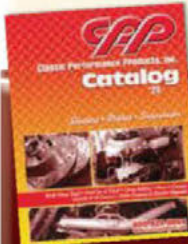


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# STRAIGHT LINE▶ SPOTLIGHT

❖ TEXT & PHOTOS: **Bruce Biegler**

## "Yes Bull" Camaro

» "Unorthodox" and "unique" are the first words that come to mind for race fans when viewing the 1968 Camaro SS convertible raced by Lil Bull (Yes, that is his legal name) out of Orlando, Florida. Bull, who began racing this car way back in 1977, has meandered it through a number of upgrades over many seasons, including experimenting with nitrous-injected, supercharged, and port fuel injected engine programs. Keeping with tradition, the latest version of the Camaro remains pretty outrageous, with a BDS roots-style supercharger sitting on top of a 540ci big-block that also includes a FAST XFI fuel injection system. The Camaro, which also features a Turbo 400 automatic transmission and an NHRA-legal full exhaust system and mufflers, focuses its participation at various Fastest Street Car events, but it is also a "black sheep" of sorts within NHRA's dragster chassis-dominated 8.90 Super



Comp category. This car, which is street driven with fully functioning lights, turn signals, wipers, and a "bull" sounding horn, is capable of running in the 8.8 e.t.'s at 155+ mph. Lil Bull's primary sponsor is his own company: BIMP (Bull's Inboard Marine Power), which is a mobile ski boat repair service.

## 10.5 Storm Troopers

» The names Chuck Ulsch, Gil Mobley, and John Ferguson are pretty much considered legendary within the Fastest Street Car racing scene, and their 2014 Corvette Stingray is quickly becoming the epitome of that association. After racing a series of ultra-successful Chevrolet cars together over a 15-year period, the team debuted their newest Corvette during the 2015 season following a 14-month build at industry-leading Vanishing Point Race Cars (Loganville, Georgia). The "Can-Am/road racing" look and configuration of their Corvette is considered quite revolutionary within the Outlaw 10.5 scene. It's been very successful since its unveiling, highlighted by a huge win at the largest 10.5 race of the year, the infamous Yellow Bullet Nationals—held each September—at Cecil County Dragway (Rising Sun, Maryland). It has also set Street Car Shootout eighth-mile class records for e.t. at 3.97 seconds and speed at 191.63 mph. This Stingray was chosen for—and exploits—GM factory dimensions and that aero package. All of the car's panels



are GM factory original except for the front clip, which was mocked up from GM panels but made out of carbon fiber. The team employs a 500ci engine program from Brad Anderson that is capable of producing in excess of 3,500 hp using a C Rotor Screw blower. The Missouri-based car gets its funding from owners Gil Mobley (Eastern Housing) and John Ferguson (South Street Auto). Associate sponsorship comes from Chuck's company (Absolute Auto & Truck Service), BAE, Neal Chance Racing Converters, NGK Spark Plugs, Mickey Thompson, and Santhuff Suspension. The close-knit team is rounded out with valued team members Jeff Weddle, John Dillinger, Keaton Rosborough, and Brian Mobley.



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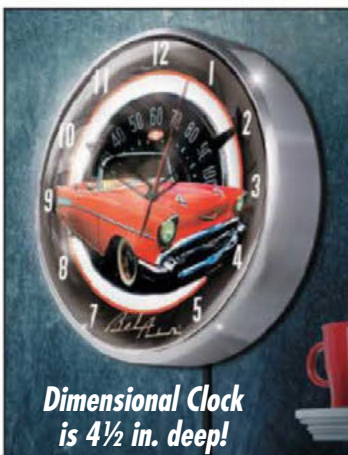
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## Versatility Added

»Texan Tommy Phillips is regarded as one of the most successful Sportsman drag racers anywhere in the nation. While his present-day career focus has been primarily racing a Chevrolet-powered Super Comp dragster and Chevy Camaro Super Gasser, Phillips has increasing aspirations for his very cool GT/CA Chevy Cavalier Super Stocker. The 2005 Cavalier was originally built by Canada's FJ Smith for Jim Boburka. Following its acquisition from Boburka four years ago, Phillips reports that the Cavalier was taken completely apart (at Sullivan Motorsports in Dallas) and was rewired, replumbed, and back-halved to add in a new four-link suspension and a different rearend housing configuration. Phillips then tasked Bret Voges (Voges Racing Engines) to build him a 358ci LT1 fuel injected engine. The engine is backed by a Pro-Trans-built three-speed automatic with an A-1 converter. After the 2 1/2-year rebuild,



the car was ready for action in December 2013. Since then the Cavalier has been run somewhat sporadically, but Phillips confirmed he is developing plans to race it more frequently in the future. To date, the car has shown that it is fully class capable—as evidenced by a best run of 9.35 seconds (1.05 seconds under the national index) and strong showings at NHRA events in St. Louis and Dallas in late 2015. Tommy and his crew (Jay and Linda Thornburg) are proud to showcase their sponsors CBS ArcSafe, K&N Filters, and Orteg Energy Technologies at all events they attend. Tommy Phillips' group is one of only a handful of professional Sportsman-level racing teams that compete full time on the NHRA circuit, and very interestingly, make a profit doing so.

## Craftsman's Showcase

»Tennessee-based, second-generation driver Ray Miller is a prime example of a racer successfully displaying his own products. Since 1989, Miller Race Cars has developed an expert reputation within NHRA and IHRA Sportsman drag racing circles by producing a series of very successful race cars (dragsters, roadsters, and door-slammers) for those circuits. In 2015, the team began using an eye-catching 1968 Camaro Super Gasser roadster as the company flagship for their craft, and that car has been very successful since its onset. The Camaro was finished in July 2015 and features a 632ci Chevy engine program built by Dave Hartman (Heart Beat Racing & Competition Engines), an Abruzzi Powerglide transmission and converter, Moser rearend, and Mickey Thompson tires to transfer the available 1,200 hp to the surface. While the focus for the car is the Super Gas 9.90 index, Ray reports that unleashed—without the throttle stop—the car can run in the 7.4 e.t. zone at 180+ mph. The high-tech Camaro is finished off with a stunning-looking scheme, which was applied by Todd's Extreme Paint. The racing reputation of Ray's team, which includes his father (Ray) and mother (Christine), is buoyed with great success, which includes multiple NHRA Divisional championships, two Jegs All-Stars wins, and three NHRA national event victories. This Camaro, which won at its debut race held in Norwalk, Ohio, last July, will most assuredly continue the Miller reputation.





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➤ **In most cases**, the people who run performance companies are more comfortable navigating the mainstream than plowing up the fringes. Mike Norcia likes to plow. The co-owner of Ram Clutches firmly believes in getting down on the ground with his stuff. He's proud of it and has been a motorhead for many long years, starting down his path as a high-school junior in Canton, Ohio.

Mike tells it: "The car was purchased in 1978. Investigation of the numbers showed it a true Rally Sport. For \$1,200 I got a clean body with 34,000 miles, a Muncie

M22 transmission, a Dana rearend, and a nice 327 ... that was split down both sides of the block! I believe the only tools the previous owner used to work on this car were a sledgehammer and a torch."

Norcia's Camaro has been a testbed for Ram products (founded by his father, John, in 1971) and its current form represents

the third stage of its development. The Camaro hosted a series of small-block engines, and along the way it was featured in a 1980 edition of *Chevy Power* magazine. Mike's kink has always been lit by a wonderful bunch of politically incorrect Pro Street heathens and he's been staunch about it ever since a street-driven

## RIDES



# THE BULL





passenger car grew wheeltubs and packed a narrowed axle. That Pro Street stuff continues to foment and keeps calling for big engines and even bigger back tires. And that Ram products persuasion? It's a quality that this writer admires. It means that Mike likes to shift for himself. And, he likes to do as much of his own

work as possible. Then the landscape changed.

In late 1983, the Norcias bolted from the Buckeye State and moved Ram to Columbia, South Carolina. The Camaro's process slowed to a snail's hump. Mike: "The car was driven very little as most of my time was spent assisting with our clutches and nitrous systems, working

with several [IHRA] Top Sportsman teams in the infancy of Pro Modified racing." But the hiatus gave him time to think; gave him ideas. In 1993 (the height of the Pro Street era), with an itch he could no longer abide, he dragged the Camaro up to Wally Stroupe at SRC Motorsports in North Carolina. Stroupe is nothing if not a staunch

(6.30 at 220) Pro Mod racer who builds some slippery drag race darts. He did the back-half conversion and installed the formidable 12-point rollcage. "The intent at the time was to turn [it] into a Pro Street car," said Mike.

Then, he and wife, Robin, decided to begin their family circle, and for the next 17 years the



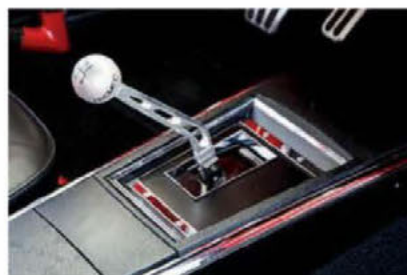
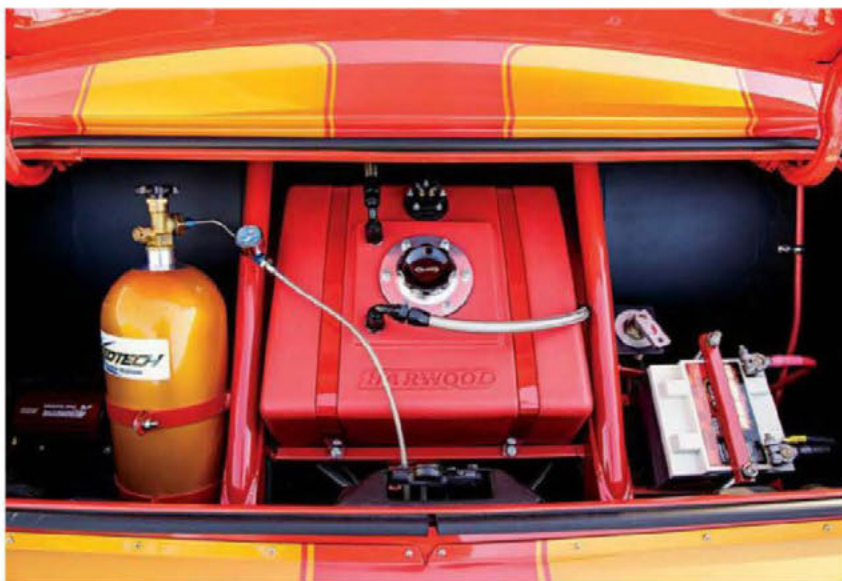
# SEES RED

Mike Norcia's ProMod Street Camaro

✦ TEXT: Ro McGonegal | PHOTOS: Robert McGaffin







Camaro lounged in his garage just as it had returned from Stroupe. Words of encouragement from his son Michael became the impetus to finish the project with the idea of producing copious clouds of tire smoke from those Mickey 15-wides. "Truly," Mike said, "all that time off enabled me to build the car exactly how I wanted to all along. The theme evolved from Pro Street, an offshoot of Pro Mod and Outlaw as delineated by a big-cube engine and deck wing." How does it differ from old-school thought? Notably absent is the trademark supercharger pile jutting from the hood.

Other qualities of mention are reliable power from a big-cubic-inch engine complete with warranty, the spit-in-your-eye stick-shift transmission where most moan for a big-mother automatic, and the return to the world before Pro

Touring (monster brakes, fat front tires, maniacal attention to handling ... and rules!). None of that is apt to incite a motorhead, but a near-600-inch engine certainly would give wood.

Now remember. Going like hell in a straight line was what you did when you didn't know how to do anything else. It was the first thing you did and you never shook that hypnotic attraction. Was it easier than screwing



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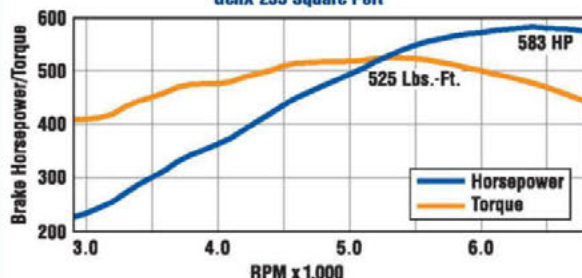
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**Test Engine:** GM 6.2L LS3 short block with 10.43:1 compression, Trick Flow GenX® 255 square port cylinder heads (TFS-3261T002-C01), Trick Flow Track Max® hydraulic roller cam (TFS-32603001), stock L92 intake with 90mm throttle body, Kooks headers with 1½" primaries, and dual exhaust with 3" Flowmaster mufflers.

**Airflow Results**  
GenX 255 Square Port

Lift Value	Intake Flow CFM	Exhaust Flow CFM
.100"	71	59
.200"	146	113
.300"	231	171
.400"	294	215
.500"	334	240
.600"	363	252
.700"	382	258

Tests conducted at 28" of water (pressure).

Bore size: 4.065"; exhaust with 1½" pipe.

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the gas pedal to the floor? Yes, it was a genuine rush. And back then, virtually all the other realms of what we now acknowledge as essential to a complete road car were barely an afterthought.

Mike is hands-on, having managed all the work, save for the chassis

changes and the paint routine. He gives a big round of applause to the cats at Summit Racing (Chuck, Carl, Alan, and JT) as well as Danny's Automotive; Dave Schwartz; Russ Richardson; and Pat, John, and Michael Norcia.

"As I have always been a Pro Street

big-cubic-inch fan, we went after a theme, call it modern Pro Street, or what the car would look like if it was built to match the standards of high-horsepower race cars today. The result is this—what I term ProMod Street. Could we be starting a new trend?" **CHP**

## TECH CHECK

**Owner:** Mike Norcia, Blythewood, South Carolina  
**Vehicle:** 1967 Camaro

### Engine

- Type:** GMPP Gen VI tall-deck crate engine
- Displacement:** 572 ci
- Compression Ratio:** 9.6:1
- Bore:** 4.560 inches
- Stroke:** 4.375 inches
- Cylinder Heads:** Aluminum rectangular port, stainless steel 2.25/1.88 valves, 118cc combustion chambers
- Rotating Assembly:** Forged steel crankshaft and connecting rods, forged aluminum pistons
- Valvetrain:** Aluminum roller rockers, 1.7:1 ratio
- Camshaft:** Hydraulic roller, 0.632/0.632-inch lift; 254/264-deg. duration at 0.050; 3/8-inch pushrods
- Induction:** Single-plane intake manifold, Holley 4150 850-cfm carburetor, Aeromotive A1000 race pump and regulator, Harwood 12-gallon fuel tank
- Ignition:** MSD 6AL, Blaster coil and primary wires; billet aluminum housing; 36-degrees total timing; Powermaster alternator; XS Power S925 battery

- Exhaust:** Dynatech headers, 2 1/4-inch primaries, 3 1/2-inch collector; Spintech mufflers; 3-inch system
- Ancillaries:** Aluminum short-style water pump, Milodon 6-quart oil pan, Summit aluminum radiator, Flex-A-Lite electric fans/shroud, American Autowire Highway Series loom
- Output (at the crankshaft):** 620 hp at 5,500 rpm, 650 lb-ft at 4,500 rpm
- Machine Work/Assembly:** Chevrolet Performance

### Drivetrain

- Transmission:** Tremec TKO 600 five-speed, Ram flywheel and Force 10.5 dual-disc organic clutch assembly, Ram hydraulic throwout bearing, QuickTime bellhousing
- Rear Axle:** Strange Engineering 9-inch, 35-spline axles, spool, 4.10:1 gears; Hurst Driveline driveshaft

### Chassis

- Front Suspension:** Speedway Motors 2-inch drop spindles, Summit Racing tubular control arms, QA1 coilover shocks
- Rear Suspension:** Four-link type with antiroll bar, Panhard rod and 12-point rollage by SRC Motorsports, QA1 shock absorbers

- Brakes:** Speedway 11-inch rotors, two-piston calipers front, Strange Engineering 11.25-inch discs rear, American Powertrain master cylinder

### Wheels & Tires

- Wheels:** Billet Specialties Comp 5 15x3.5 front, 15x14 rear
- Tires:** M/T Sportsman 26x6.00 front, LT31x18.5 rear

### Interior

- Upholstery:** N/A
- Material:** Vinyl
- Seats:** Summit Racing
- Steering:** OE box, Grant GT wheel
- Shifter:** Hurst
- Dash:** OE with custom instrument pod
- Instrumentation:** Auto Meter Elite Series
- Audio:** N/A
- HVAC:** N/A

### Exterior

- Bodywork:** Color by Weasel (aka Mike Johnson) (Lugoff, SC)
- Paint by:** Weasel
- Paint:** House of Kolor Red w/ HOK Pearl Gold stripes
- Hood:** ZL2
- Grille:** RS
- Bumpers:** OE
- Wing:** Stroupe Motorsports

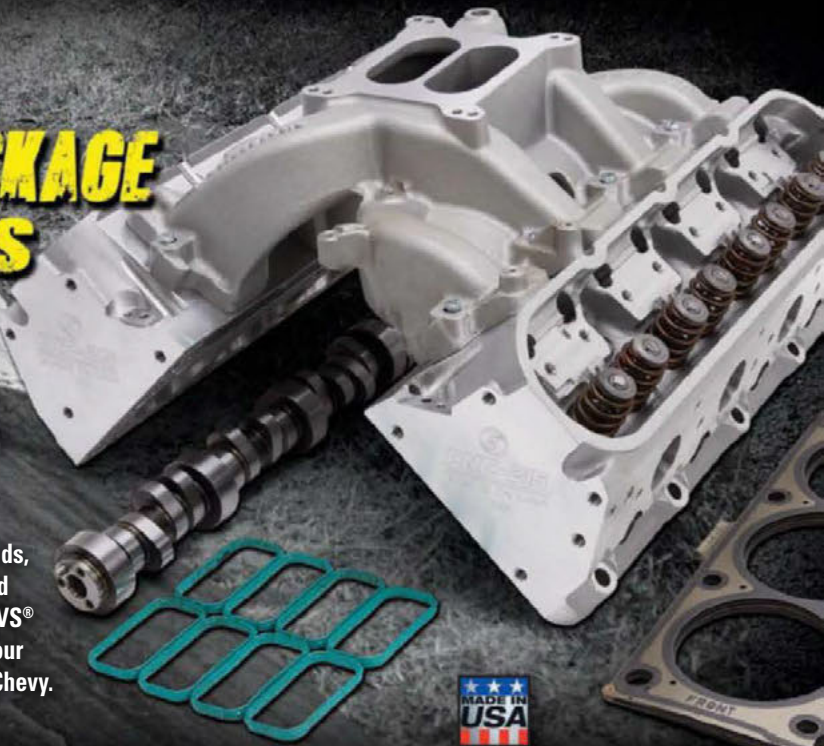


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# A PERFECT RECIPE – PART 1

Building big power is easy when you have the right parts and a good plan—lots of cubes and boost helps, too

♦ TEXT: **Pete Epple** | PHOTOS: **Pete Epple** AND COURTESY OF **the Manufacturers**

**T**hey say bigger is better, and there's nothing better than a boosted big-block! The plan for this engine is pretty simple: build a boosted 565ci big-block Chevy street engine capable of making at least 1,700 horsepower. We wanted something that could be driven to the track, raced, and driven home. However, when you start talking about power numbers nearing 2,000 hp, it's never simple.

It started with a calculated and exact plan. After ironing out some details with the brilliant minds at Holley, we decided on a Holley Dominator EFI

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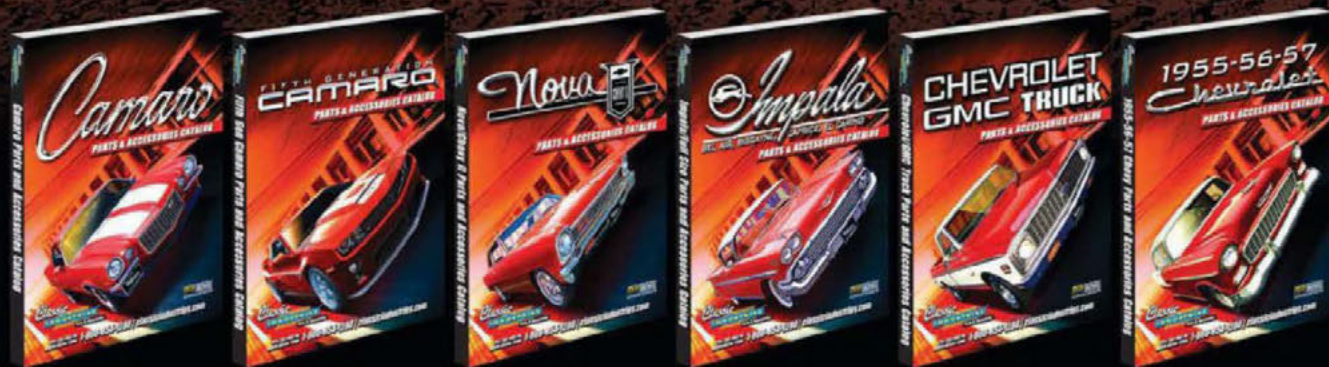
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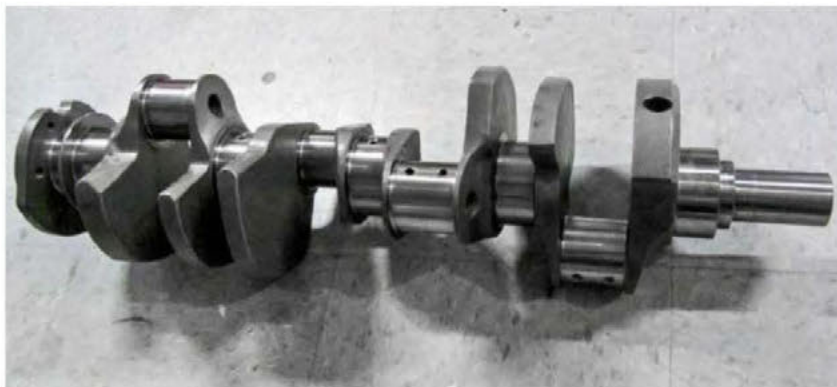
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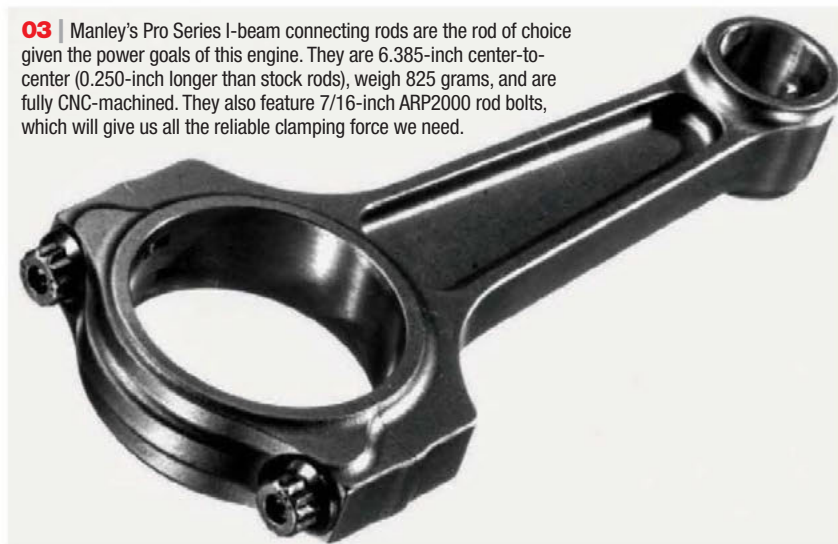




**01** | The base of the whole engine is the Dart Big M cast-iron block (PN 31263644), which we got from Summit Racing. It features a standard 9.800-inch deck height with 4.600-inch bores. It has extra thick cylinder walls, four-bolt mains, and a priority main oiling system. This block is designed to handle anything we can throw at it!



**02** | The rotating assembly is from Manley Performance. The crankshaft is a 4.250-inch stroke piece, forged from 4340 alloy. It's heat-treated, stress-relieved, shot-peened, nitrided, and Magnafluxed. It uses large-radius journals (requiring narrowed rod bearings), which provide added strength, and it's finished by Manley's micropolishing process.



**03** | Manley's Pro Series I-beam connecting rods are the rod of choice given the power goals of this engine. They are 6.385-inch center-to-center (0.250-inch longer than stock rods), weigh 825 grams, and are fully CNC-machined. They also feature 7/16-inch ARP2000 rod bolts, which will give us all the reliable clamping force we need.

system and three pages of goodies to go along with it. The system seemed as if it was designed around the versatility we were looking for in an EFI system.

Next, the plan was laid out to the guys at Summit Racing, and they quickly expressed interest in the project. We put together a parts list that would give us enough strength to exceed our horsepower goals.

Knowing we needed a rotating assembly that could take some serious abuse, we turned to Manley Performance. They sent us a crankshaft, connecting rods, pistons, rings, and bearings, which all came as a package designed especially for our 565ci combination.

The heart of this combo is Manley's 4.250-inch stroke 4340 alloy forged steel crankshaft. Their 4340 alloy Pro Series I-beam connecting rods link the crankshaft to the pistons. They are 6.385-inch center-to-center and are fully CNC-machined. The rod bolts are premium 7/16-inch ARP2000s. Manley Platinum Series BB 4.600-inch bore pistons complete the assembly. Forged from 2618 high-strength alloy, these flat-top pistons are an excellent combination of a relatively lightweight material and durability.

Valvetrain is extremely critical when you look at the goals of the engine. Coupled with the fact that it is going to see a fair amount of street time, the valvetrain components need to be able to take some severe abuse. We reached out to Comp Cams and they were more than happy to help us lay out the right parts to make reliable power.

The short-block needs to be topped with a set of cylinder heads capable of flowing large amounts of air without a lot of restriction. We wanted to go with a traditional style big-block head to avoid the cost and custom work associated with more exotic heads. Trick Flow Specialties' new PowerPort 365cc cylinder heads for big-block Chevy engines were given the nod for their high-flow numbers, low cost, and overall power potential.

Air will be forced into the cylinder heads by a crank-driven centrifugal supercharger. Given our goals and the required boost to get there, there was no one else to talk to but ProCharger. ProCharger's F-1X-12 will easily crank out the 25-plus pounds of boost we are looking for without breaking a sweat. With some upgrades to the fuel system and a



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## A Perfect Recipe - Part 1



**04-05** | Manley Platinum Series Big-Block pistons finish off the rotating assembly. They are a flat-top design for a 4.600-inch bore and are forged from 2618 high-strength alloy. They have a 0.250-inch thick crown and a 1/16-inch top ring groove that is 0.350-inch down from the deck. This provides ample cross-sectional thickness in these critical areas.



little more boost, we should easily be able to take this engine north of 2,000 horsepower.

Knowing that the machine work and assembly plays just as big of a roll as picking the right parts, we turned to Scotty G at Scotty's Racing Engines in Spring Hill, Florida, to handle the build. His reputation is second to none, and he is known for building big, reliable power. You will be able to read more about Scotty G, and see him in action as we start to dive into our 565ci engine.

Stay tuned for Part 2 as we cover all of the details of the Holley Dominator EFI system, as well as the machining, assembly, and dyno testing of our ProCharger supercharged big-block engine. **CHP**

**06** | Manley also supplied Clevite H-series bearings and Total Seal piston rings to complete the package.



**07** | Our 565ci engine features a billet oil pump from Moroso. This high-volume, high-pressure pump features special anticavitation slots, feeder grooves, and an enlarged bypass area that is machined into the housing to bleed oil back to the inlet side of the pump.



**08** | We reached out to ATI Performance for one of its Super Dampers. It is designed for a double-key setup to handle all the power we plan on making. ATI's proven elastomer is designed and tuned to eliminate harmful crankshaft harmonics that cause parasitic horsepower loss. They are actually two dampers in one: a 4-inch-diameter inner damper and a 7-inch-diameter outer damper in two shells that bolt to the crank hub.



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## A Perfect Recipe - Part 1

**09** | For our big-block, we turned to Comp Cams for a custom-grind solid roller shaft. Chris Ryan is a cam designer at Comp, and he put together a cam profile that would make great power and be easy enough on parts to live on the street. The cam has 0.741-inch lift on the intake side and 0.748-inch lift on the exhaust side, with duration of 271/284 degrees at 0.050-inch lift, respectively, and a 115.5 LSA.



**10** | Comp set us up with a set of its Elite Race Solid Roller Lifters. They are top-of-the-line and will work great for our boosted big-block. The pushrod inserts can be changed for centered, left, or right offsets; they are designed for better oil control through the pushrod insert, which allows builders to modify lifters to meter extra oil to the top; tool-steel, pinned axles allow for extra needle bearings (total of 23) for optimum load distribution; the oversized (0.400-inch) axles are pinned for strength and durability; pressure-fed oil flows through the axle directly to the needles; the captured link bars are designed specifically for race and high-rpm applications. This design offers maximum control and durability.



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**11** | We went with a set of Comp's Ultra Pro Magnum XD Rocker Arms. These arms are engineered from super-durable 8650 steel for max strength and reliability. These stud-mount rockers are fully rebuildable and use precision-sorted needle bearings and hardened roller tips to better distribute the load and reduce wear for a longer service life.

**12** | We decided on a Hi-Tech Belt Drive system from Comp Cams. This is an extreme-application belt, built for high-rpm and high-compression durability and features an infinitely adjustable Vernier sprocket for absolute timing accuracy. A unique belt idler system reduces flap throughout rpm range.



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**13** | The short-block is topped with a set of Trick Flow Specialties' new PowerPort 365 big-block aluminum cylinder heads. These heads are designed for 500-plus cubic-inch extreme performance applications. They feature top-of-the-line CNC competition-ported runners with a high-resolution finish for maximum airflow and power. They also feature 24-degree valve angles with 4-degree side cants to further increase airflow.



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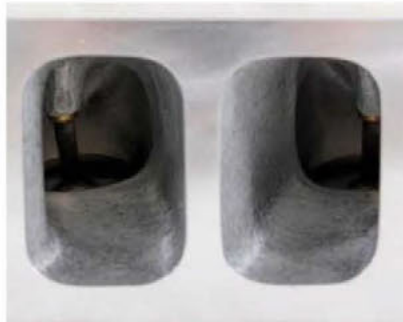
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## A Perfect Recipe - Part 1



**14** | Trick Flow's PowerPort 365 cylinder heads come with stout triple-spring valvesprings. The outer diameter of the springs are 1.645 inches, and they are held in place with titanium retainers. Max lift is 0.900-inch lift for high-power applications.



**15** | Trick Flow's heads feature 365cc intake runners for massive airflow. They come CNC-ported from Trick Flow, but there is still room for additional porting.



**16** | The heart-shaped combustion chambers check in at 119 cc. The intake valves measure 2.350 inches and the exhaust valves are 1.880 inches. The chambers are CNC-machined and have bowl-blended valve seat transitions to promote high-velocity and huge airflow volume.



**17** | To top off the Trick Flow cylinder heads, Moroso sent us a set of its billet valve covers. CNC-machined from billet aluminum, these will not only provide great aesthetics, but the precise machined finish, combined with Moroso's valve cover gaskets, will give us a perfect seal. We will also be installing a belt-driven vacuum pump from Aerospace Components. We will tell you all about it and how it works in an upcoming story.





**18** | With any engine build, there are many parts and pieces needed to complete the assembly. We ordered our parts from Summit Racing, which featured a slew of hardware from ARP. We will be using ARP head studs, main studs, valve cover hardware, intake bolts, crank bolt, and many other fasteners to complete the engine.



**19** | We will be using ProCharger's F-1X-12 supercharger. This is a massive supercharger that will easily make in excess of 25 psi of boost. The head unit is essentially a hybrid of two of ProCharger's race blowers: the F-3 and the F-1X. It features the large 12-inch housing of the F-3-series of superchargers with the impeller and transmission of the F-1X. This will give us a little less low-end power, but all the top-end charge we will ever need or want!

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# GET WHAT YOU NEED

Drake Kelley's Scare-O-Meter Chevelle

TEXT: **Ro McGonegal** | PHOTOS: **Robert McGaffin**

RIDES





It's always fun to be a thousand miles away from the status quo. While Pro Touring (and all that it implies) is the current darling of the hobby, we know that such cars are integral with the other disciplines (mainly because we say there are). This isn't Camaro Central, folks, it's *Chevy High* and Drake Kelley's jacked-up berserker cannot be discounted. In the horde of the fat-tired and the low-slung, it stands out like a big, black eye.



There is reality and there is perception. Kelley's sky-high, all-steel 1964 Chevelle carries a bit of both. It has drag race history and was tended by the tube-axle terrorists at Blair's Speed Shop in Pasadena, California. At one time, Blair's was celebrated as the only place that you took your junk for a stick-axle conversion and hundreds of cars (mainly Tri-Fives) dropped their heavy and complicated unequal-length A-arms on Blair's garage floor.

To preface this history, you have to realize that Drake's father, Dick, was on the case as a high-school kid in 1963 and '64. He had a primo 1957 Bel Air fitted with a 327 engine and a Muncie box, a candy apple green paintjob, and black tuck-and-roll settled all over the inside.

Sure. You know it got clipped off the street in front of his house. You know it was stripped to the bone. You know he never saw his heartbeat car again. But that aura never dissipated. Dick's lament lasted for years, but his thoughts curiously became Drake's inspiration as well.

Dick and Drake continued to fan the flame and they built countless cars in their heads, but "between sports, school, and work, we could never quite pull the trigger on the project," Drake

admitted. "Five years ago, I became a partner in a company that built custom/drag river boats with monster power and triple-digit capability. I learned a lot from that experience. As this boat phase was winding down [my dad and I] began having the car conversation again."

Here's what happened: In the spring of 2014, they bought a 1969 C10, intending to clean it up and sell or trade it as they worked toward their dream of the '57. They soon traded the truck outright for a full-on Pro Street 1972 Chevelle. They spiffed up the 'Velle ... and as car junkies, they began the search immediate for something else to trade. They came across this '64 Chevelle and wouldn't you know it, owner Frank Lindsey was also in swap mode. He always wanted a Pro Street car and Drake was itching for something like a gasser.

The progenitor was Denny Bolf, who lived in Sylmar, California, at the time. He named it Wile E. Coyote and raced it for years at SoCal tracks as a C/Altered, running 9s at a buck-forty. After the retirement party, the car went absolutely black, shelved in a barn for several decades, and later in a horse corral in Littlerock, California. Mike Tussey became its next steward. He

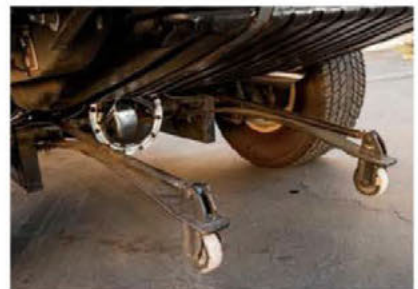






played with it a little, dropping in a mild 327, a Muncie four-gear, and renewed brakes and suspension. And as if all of this was preordained, he kept the cycle intact and sold it to Lindsey who lived nearby in Lancaster. It was Lindsey who plugged in the 406 and the T10, and got the package smoothed out, repainted, and reupholstered.

Drake says that as they dove into the car, he and his dad fell completely in love with everything about it. They went through the entire platform. Ryan Johnson massaged the engine, replacing gaskets and seals, tuning the carburetors and servicing the transmission. A little later, Tim Lee (at Don Lee's Auto Service in Rancho Cucamonga) refreshed the window trim, moldings, and inserted fresh felt strips.







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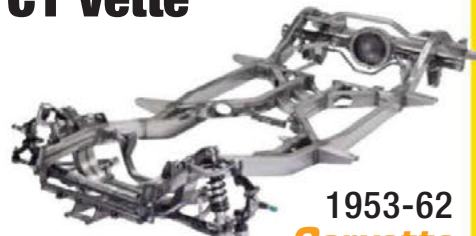
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Though the car has been rehabbed, there are still tattoos, lots of clues about its past: a righteous patina on some of the original plated parts, some scuffs here and there, even a stripe or two of rust lingers. In the end, the Kelley's didn't get what they wanted. But they got what they needed. Or maybe not.

Then there's this: Junkie logic is the ability to justify whatever needs to be done to support a habit, be it automobiles or anything else. No doubt the Kelleys have a serious jones. Ol' Wile has a new master now, ex-GM employee and collector Craig Andrews down in San Diego. It was the birth of Drake's first son that precipitated the exchange. The Chevelle had a 'cage that he didn't want to molest—he wanted something with a back seat so his kid could experience the ether, too, and in the end Drake did get what he needed. **CHP**

## TECH CHECK

**Owner:** Drake and Dick Kelley, Rancho Cucamonga, California  
**Vehicle:** 1964 Malibu SS

### Engine

- **Type:** 1972 small-block
- **Displacement:** 406 ci
- **Compression Ratio:** 10.0:1
- **Bore:** 4.125 inches
- **Stroke:** 3.75 inches
- **Cylinder Heads:** Cast-iron double-hump, ported
- **Rotating Assembly:** Forged crankshaft, connecting rods, and pistons
- **Valvetrain:** Comp Cams 1.6:1 rockers, Manton pushrods
- **Camshaft:** Comp Cams solid roller, Pete Jackson geardrive
- **Induction:** Edelbrock Tunnel Ram, 2x4-bbl Holley 650-cfm carburetors, velocity stacks w/ K&N elements, Holley electric pump, OE fuel tank
- **Ignition:** Accel distributor and Super Coil, 36-degrees total timing
- **Exhaust:** Hooker Super Comp headers with 1 5/8-inch primaries, 3-inch aluminized system with Flowmaster 40 mufflers
- **Ancillaries:** Reworked four-core GM radiator, OE oil pan, Weiand water pump
- **Output (est.):** 350 hp at 6,000 rpm, 400 lb-ft at 5,000 rpm
- **Machine Work/Assembly:** N/A

### Drivetrain

- **Transmission:** Borg-Warner T10, Centerforce Dual-Friction 11-inch clutch, vintage Ansen two-piece bellhousing
- **Rear Axle:** GM 12-bolt, 4.10:1 gears, spool, built by Denny Bolf (Henderson, NV); 60-inch steel prop shaft w/ HD U-joints

### Chassis

- **Front Suspension:** Blair's Speed Shop straight-axle conversion, leaf springs, tube shocks, bump-steer damper
- **Rear Suspension:** Leaf springs, tube shocks, Denny Bolf lift bars; wheelie bars by Blair's; six-point rollbar
- **Brakes:** OE drums, front and rear

### Wheels & Tires

- **Wheels:** American Racing Torq-Thrust 14x7 front, 15x10 rear
- **Tires:** Hankook Optima 195/75 front, Hoosier Pro Street LT 31/12.5 rear

### Interior

- **Upholstery:** Paul Dunham, Classic Touch Upholstery (Lancaster, CA)
- **Material:** Vinyl
- **Seats:** OE, Simpson lap belt
- **Steering:** OE, Mooneyes Classic 13-inch 3-hole wheel
- **Shifter:** Hurst Competition Plus
- **Dash:** OE with insert
- **Instrumentation:** So-Cal Speed Shop

### Exterior

- **Bodywork:** Westside Auto Body (Lancaster, CA)
- **Paint By:** Reuben at Westside Auto Body; graphics by Kick the Can Studio (San Dimas, CA); chrome by Millennium Polish & Chrome (Ontario, CA)
- **Paint:** Wimbledon White/Toyota Voo Doo Blue, gold leaf lettering by Kick the Can Studio
- **Hood:** OE
- **Grille:** OE
- **Bumpers:** OE rear





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# PICKING THE CORRECT CARB

Experts suggest the best choices for five basic engine combos

♦ TEXT & PHOTOS: **Barry Kluczyk**

**R**egardless of the larger target of extracting big power from your engine build is the primary goal of building a well-tuned combination that provides strong performance across the rpm band. And as every magazine story, blog post, and YouTube video will tell you, no single component will provide the catalyst for perfect performance.

However, certain parts contribute greatly toward an engine's overall operation. The camshaft is obviously one of the biggies and so is the carburetor. Generally, many home engine builders tend to go big on their carb choice, assuming they can "jet it down" during tuning to arrive at the perfect combination. That may work in some cases, but it's not necessarily the most efficient or effective method.

To arrive at the most appropriate carburetor choice, there's a basic formula: engine displacement multiplied by maximum rpm divided by 3,456. For example: a typical 355ci small-block—a 0.030-over rebuild—with a 6,000-rpm max engine speed would work well with a 616-cfm carb ( $(355 \times 6,000) \div 3,456 = 616.32$ ).

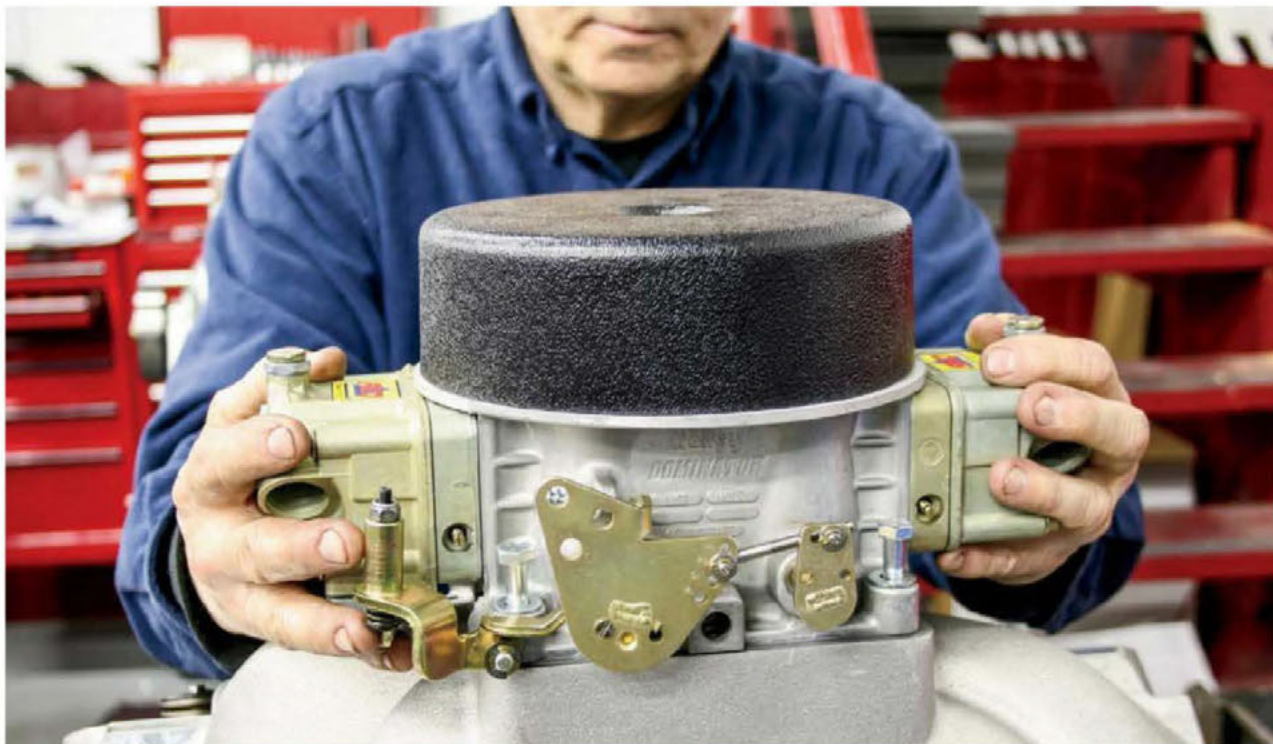
But wait—there's more! You'll also need to multiply the result by the basic volumetric efficiency of the engine—the capability of it to process the air/fuel charge. For a stock-type engine, it's 80 percent. For mildly modified engine, it's around 85 percent, and for highly modified engines with high compression, it's

about 95 percent.

So, for that 355 engine, the 616-cfm rating translates to 493 real-world cfm on a stock combination; 524 cfm on a mildly built engine; and 585 cfm on a high-compression, high-performance combination. And because carburetors aren't sold with such specific flow ratings, you'd select the closet model above that rating, such as a 600- or 650-cfm carb.

Sorry. We should have warned you math would be involved with this story.

Holley and Summit Racing have interactive carb selection calculators on their websites, which factor in the various volumetric efficiency options, while Edelbrock's site offers a range of volumetric efficiency formulas. None,





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## Picking the Correct Carb



◆ On the street or strip, proper carburetor selection is essential for optimal performance. Besides the basic formula for determining the proper cfm requirement—(displacement x max rpm) ÷ 3,456—other factors include the degree to which the engine is built for high-performance (volumetric efficiency), the transmission, and even the weight of the vehicle.



◆ Volumetric efficiency is higher in a high-performance engine, where the right camshaft and complementing components do a better job of moving air in and out of it. High compression has a big effect on volumetric efficiency, too, as the added squeeze delivers more power, thus greater efficiency, than a comparably sized, lower-compression combination.



◆ Between the primary performance carburetor manufacturers Holley and Edelbrock, only Holley offers models with mechanical secondary circuits. They would be from the legendary Double Pumper range. Holley's other carbs feature vacuum-actuated secondaries, which are recommended for all-around street use and moderate street/strip engines.



◆ The basic Holley carburetor four-barrel family includes the smaller 4150 and 4160 series and the larger, 4500 series, commonly known as the Dominator. The 4150 series shown here is the more performance-oriented version of the smaller carbs, thanks to a secondary metering block with removable jets. The 4160-type's secondary metering plate doesn't have removable jets, but it can be converted to a 4150-type.



◆ Edelbrock's four-barrel carburetors are based on the classic Carter AFB, which also spawned the Quadrajet carburetor used on countless GM production models. They're rated up to 800 cfm and contain a feature called adjustable valve secondary (AVS), which allows changing of the secondaries' opening rate with the easy turning of a screw.



◆ Although Holley and Edelbrock performance carburetors are delivered pretty much ready to run out of the box, some adjustments to the fuel curve may be required. Power valves and jets can be swapped in the Holleys (seen here), while in the Edelbrock carbs, metering rods with jets perform the same function. There is a wider array of tuning possibilities with the Holley carbs, but the Edelbrock design is generally easier to work with and make adjustments.



◆ Forced-induction engines have unique carburetor requirements. In a naturally aspirated engine, the engine will drop to nearly zero vacuum under wide open throttle (WOT). That, in turn, opens the power valve to enrich the mixture. That's not the case under boost and the result can be engine-destroying detonation, because the power valve circuit is closed and the engine leans out catastrophically. "Blower" carbs are modified to ensure positive pressure at WOT, eliminating the possibility of the power valve closing.

however, takes into account other factors such as the intake manifold—low-rise vs. high-rise or single-plane vs. dual-plane, the airflow capability of the cylinder heads, and whether there's a power-adder involved. Heck, the weight of the car and even the axle gearing and torque converter stall speed can affect the optimal carb choice.

When it comes to a Holley carb, there's also the question of vacuum-actuated or mechanical secondaries. For most street and street/strip engine combinations, you'll want to go with vacuum secondaries for greater driveability. Mechanical-secondary carbs—the classic "double-pumper" design—should be reserved for truly high-performance combinations and, as Holley recommends, lighter vehicles with a curb weight of 3,100 pounds or less.

With Edelbrock's carburetors, which are based on the classic Carter AFB design, they're all of the mechanical-secondary type, so the only real choice after determining the appropriate cfm rating is whether you want an electric or manual choke. And you probably want an electric. The Edelbrock carburetors have a secondary air door, on Performer Series carbs they have a counterweighted, non-adjustable door below the secondary boosters, and the Thunder Series carbs have a secondary air door that is spring loaded and adjustable above the secondary boosters. It's designed to accommodate lighter or heavier vehicles, to allow it to open early or late, with a simple adjustment on the spring.

With all the caveats regarding applications, we wanted to boil down the carburetor conundrum and took the easy way out: We enlisted experts Smitty Smith from Edelbrock and Blane Burnett from Holley for recommendations on the optimal carburetor choices for five theoretical engine builds, ranging from small-blocks to big-blocks and to the increasingly popular LS swap. We've assumed that all will be used with automatic transmissions.

Again, there could be differences depending on the vehicles the engines would go in, but their input provides a good, general overview for carb selections used mostly on the street and occasionally on the strip. Standard disclaimers apply: Your mileage may vary, ask your doctor before using heavy machinery, offer void in Tennessee, and so on. **CHP**





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## :Picking the Correct Carb

### ENGINE #1

Type: 350 Small-Block

Dyno target: 325 hp

We start off with an entry-level buildup—one that countless enthusiasts embark on every year. Rebuilding the classic 350 on a budget, but aiming for more than the factory offered in a smog-strangled package from the 1970s or '80s. With that in mind, our theoretical small-block would wear an aluminum dual-plane intake atop a set of breathed-on heads and a mild roller

camshaft. Nothing exotic or pricey—just a straightforward, affordable combination for a second-gen Camaro, C10 or G-body.

**Blane Burnett (Holley):** A 650-670-cfm Ultra Street Avenger carb would be appropriate here.

**Smitty Smith (Edelbrock):** For an everyday driver small-block like this, a Performer Series 600-cfm carb is suggested—either PN 1405 with a manual choke or PN 1406 with an electric choke.



◆ Holley 670-cfm Ultra Street Avenger with vacuum secondaries and electric choke, PN 0-86670BL.



◆ Edelbrock Performer Series 600-cfm carburetor with electric choke, PN 1406.

### ENGINE #2

Type: 383 Small-Block

Dyno target: 450 hp

Stepping up the small-block ladder, this engine is a decidedly high-performance street engine based on the classic stroker combination. Because it would be used mostly on the street, with a few annual forays down the dragstrip, we'll go with an open-plenum intake to optimize the street/strip capability. Ported aluminum heads and an aggressive roller camshaft with more than 0.525-inch lift and a comparatively wide lobe separation angle to complement its low-rpm torque capability with higher-rpm horsepower.

**Burnett (Holley):** Depending on

a few other factors for the vehicle it's going into, a 670-770-cfm Ultra Street Avenger carburetor would fit the bill. This would also be a good choice for Holley's Terminator EFI system, which supports up to 600 horsepower.

**Smith (Edelbrock):** This would be a perfect combination for one of our Thunder Series 800-cfm carbs—PN 1812 for manual choke or PN 1813 for electric choke.



◆ Holley Terminator EFI system with four-barrel-style throttle body.



◆ Holley 770-cfm Ultra Street Avenger with vacuum secondaries and electric choke, PN 0-86770RD.



◆ Edelbrock Thunder Series 800-cfm carburetor with electric choke, PN 1813.



## ENGINE #3

Type: 454 Big-Block

Dyno target: 425 hp

Similar to our basic 350 small-block, this would be a budget-minded, pump-gas big-block used almost exclusively on the street. It would use something like Chevrolet Performance's affordable iron rectangular-port heads, with large 325cc intake runners, and one of their hydraulic roller camshafts delivering 211/230-degrees duration and 0.510/0.540-inch lift on a 112-degree LSA. With a single-plane intake, it would be a great, street-friendly tire turner for a truck, Chevelle, or early Monte Carlo.

**Burnett (Holley):** The classic 750 Double Pumper is the hands-down choice here. It was made for a combination like this—even if the vehicle is heavier than 3,100 pounds.

**Smith (Edelbrock):** One of Edelbrock's Performer Series 800-cfm carbs is perfect for a mild big-block. Use PN 1412 for manual choke or PN 1413 for electric choke.



◆ Holley 750-cfm Double Pumper carburetor with mechanical secondaries and manual choke, PN 0-4779C.



◆ Edelbrock Performer Series 800-cfm carburetor with electric choke, PN 1413.

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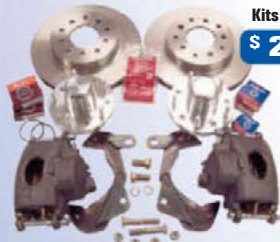
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## Picking the Correct Carb

### ENGINE #4

Type: 572 Big-Block

Dyno target: 600 hp

This is our Street Outlaws-wannabe big-block combo intended to be used with a supercharger or turbo system. We're not talking about the baddest of the bad, money-is-no-object assembly here, but a purpose-built, track-oriented combo with big heads, a big cam, and a valvetrain that will handle boost-generated forays into high rpm. The thought here is 10- or even 9-second e.t.'s in the right vehicle, with some limited street time for cruise nights, etc.

**Burnett (Holley):** An 850-cfm Demon blow-through carburetor would work best here. It's built specifically for force-induced engines, increasing the vacuum signal under boost to enrich the mixture and avoid detonation.

**Smith (Edelbrock):** To be honest, this combination would probably exceed Edelbrock's carburetor range, but on a 572 big-block that uses a tall-deck (10.2-inch) block, I'd suggest our Super Victor intake manifold PN 2927 with, say, a 4500-series carburetor and the power-adder of your choice.



◆ Holley 850-cfm Mighty Demon "blow-through" carburetor for forced induction, with mechanical secondaries, PN 5563020BT.



◆ Edelbrock Super Victor intake manifold recommended for 4500-series carburetors with power-adder, PN 2927.

### ENGINE #5

Type: LS3 LS swap

Dyno target: 500 hp

LS engine swaps continue to gain popularity and for good reason. The LS family is compact and lightweight and the factory cylinder heads offer exceptional airflow capability that translates into big horsepower. With the right camshaft, a naturally aspirated 6.2-liter LS3 will zip past the 500hp mark with one connecting rod tied behind its back. Our theoretical combination would be simple: A stock bottom end, a Comp Cams XFI camshaft with 0.566/0.576-inch lift and a 113-degree LSA, and that's about it.

**Burnett (Holley):** A 770-cfm Street Avenger works great with a carbureted, deep-breathing LS engine. It's what Chevrolet Performance recommends for their LS crate engines.

**Smith (Edelbrock):** Edelbrock's Thunder Series 800-cfm carb—PN 1812 for manual choke or PN 1813 for electric choke—is the way to go. Additionally, our E-Street EFI system is a great alternative to a carb here. It will support up to 600 horsepower.



◆ Edelbrock Thunder Series 800-cfm carburetor with electric choke, PN 1813.



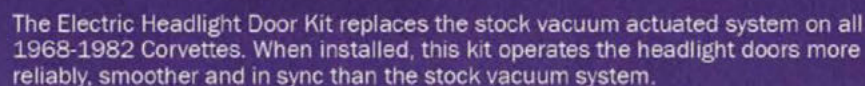
◆ Holley 770-cfm Street Avenger carburetor with vacuum secondaries and electric choke, PN 0-80770.



◆ Edelbrock E-Street EFI with four-barrel-style throttle body.



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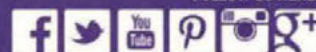
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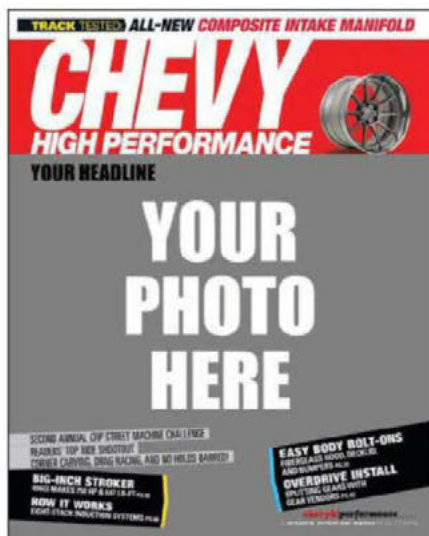


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# A TALE OF TWO CHEVYS – PART 2

Topping our short-blocks

✦ TEXT & PHOTOS **Ron Ceridono**

**A**s we said in “A Tale of Two Chevys – Part 1,” the plan to build a pair of Gen I Chevrolet small-blocks came into being during one of those “Wouldn’t it be cool to do” bench racing sessions with John Beck of Vintage Hot Rod Design. The conversation centered on building what would now be considered vintage engines, both destined to power hot rods that would be regular drivers with reliability and driveability more important than huge horsepower numbers.

As the discussion continued the elements of both engines went from fuzzy to focused. John wanted to build a blown 302-incher and we wanted to breathe life back into a 283 that was sitting in the corner of our shop and top it with three two-barrel carburetors. Thanks to Weiand and Holley that’s just what we did. Weiand had just come out with their nostalgic 6-71 supercharger kit and Holley introduced their new Tri-Power setup—what other choice did we have? It was time to build a pair of engines.

In Part 1 we covered the building of both short-blocks; but to recap, John’s blown engine is based on a large-journal 350 block overbored 0.030 inches to 4.030 inches coupled with a 3.00-inch stroke 302 crankshaft, resulting in 306 cubic inches. Our 283 block was sonic checked then overbored 0.060 inches

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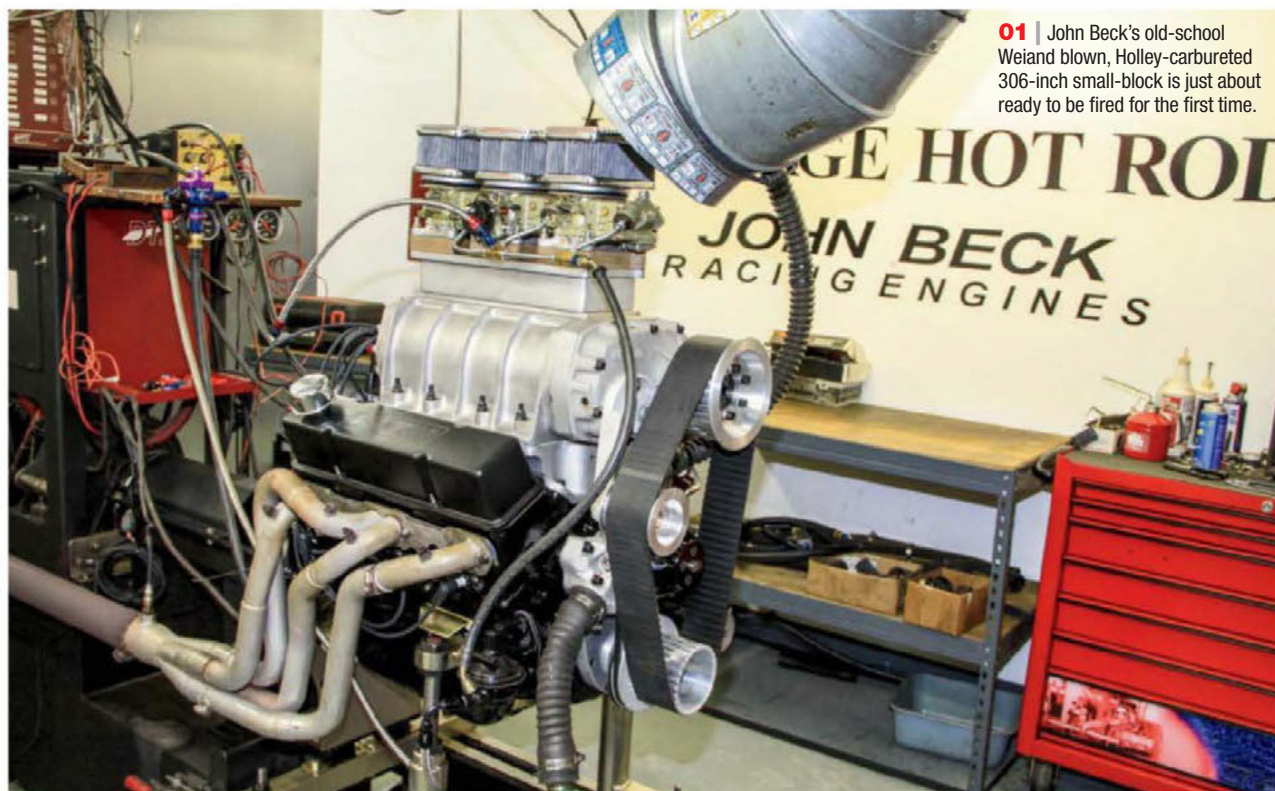
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to 3.935 inches and combined with a 3.25-inch stroke 327 crankshaft for a displacement of 316 cubic inches.

## HEADS

Sticking with the vintage theme, both engines use early cast-iron cylinder heads (pre-1969 style without accessory mounting holes). The naturally aspirated engine uses Power Pack heads (dated January 1961). John installed larger valves, but the proximity of the new 2.02-inch intake and 1.60-inch exhaust



**01** | John Beck's old-school Weiand blown, Holley-carbureted 306-inch small-block is just about ready to be fired for the first time.



valves to the edges of the chambers prompted some concern about shrouding. In other words, flow could actually be restricted in those areas, and the advantages of bigger valves would be lost. The cure was to reduce the intake valves to 2.00 inches and widen the areas of the combustion chamber closest to the valves. Additional headwork was done to open up the bowls and smooth the intake and exhaust ports.

The heads for the blown engine are “camel hump” castings from 1967-’68 equipped with 2.02-inch intake and 1.60-inch exhaust valves. The bowls and ports were opened up and smoothed, but because these heads were so much better to begin with they required considerably less effort than the Power Pack heads.

As we said, some of the shared goals for both engines were reliability and longevity—to that end, compression ratios were kept on the conservative side. The combustion chamber size, piston design, and deck heights were coordinated to provide compression ratios of 7.1:1 for the blown engine and 9.6:1 for the naturally aspirated engine.

## IGNITION

For ignition systems we wanted distributors that looked like vintage points-controlled units but had all the latest electronics under a small-diameter cap. To give us what we needed, we turned to PerTronix for a pair of their Flame-Thrower plug-and-play distributors. The Ignitor III technology provides multiple sparks over the entire rpm range and there is what is called “adaptive dwell,” which maintains peak spark energy throughout the entire rpm range.

## INDUCTION

When it comes to induction systems, there are two distinct methods of making a statement: a trio of carburetors or a 6-71 blower.

Tri-Power is the stuff legends are made from. Not only do they look cool, but they’re really practical, too. Holley’s new system uses a Weiand 3x2 intake manifold with three Holley two-barrel carbs. The center carb is rated at 325 cfm and is equipped with a choke, whereas the outboard carburetors have no chokes and are rated at 350 cfm each. Thanks to the included progressive throttle linkage you can cruise around on the center carburetor for economy, but as the throttle pedal passes the two-thirds point, the outboard carburetors come



**02** | Waiting its turn on the Vintage Hot Rod Design dyno is our naturally aspirated, Tri-Power-equipped 316. Water pumps on both engines are from Weiand, this engine uses a Rattler crank damper.



**03** | Heads for the 316 are 1961 Power Pack castings. They were updated with Comp Cams’ screw-in studs, guideplates, springs, locks, and retainers.



**04** | John opened and reshaped the bowls above the valves and blended them into the ports. The valvguides were trimmed to reduce restriction.



**05** | Intake valves are 2.020-inch Federal-Mogul replacements that were cut down to 2.00 inches. Note that the chambers have been opened up around the valves to reduce shrouding.



## A Tale of Two Chevys - Part 2

online and all three reach wide open simultaneously.

Holley's Tri-Power kits are available with dichromate or shiny finish carburetors. Fuel lines, progressive linkage, and reusable air filters with polished housings are included.

For a variety of reasons, vintage blowers were getting hard to come by—a situation that Weiland decided to address by introducing redesigned 6-71 cases. The vintage no-name look makes them appear right at home on a street engine or a

cackelfest dragster.

Inside these all-new blower cases are roots-type, two-lobe rotors. The heavy-duty rear plate uses sealed ball bearings to support the rotors; up front, the bearings and gears are lubricated by an oil bath. Weiland's nostalgic supercharger kits include a polished or satin 6-71 supercharger with gears and bearing plates, supercharger intake manifold, 2-4V carburetor adapter, all the required gaskets, 3-inch Gilmer belt, pulleys, brackets, idler, and necessary fasteners.

All Weiland's superchargers are boost-tested and engineered to produce 10-12 psi of boost on small-blocks and 5-7 psi on big-blocks, but as they say, these blowers are a simple pulley change away from pump gas or hard-core racing.

### TESTING

The blower on John's small-block was topped with the same carburetor setup as our naturally aspirated engine, and it too used a progressive throttle linkage to operate them.

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**06** | The exhaust valves are 1.60-inch Federal-Mogul replacements. Again, the chambers have been opened to reduce shrouding.



**07** | To provide reliable sealing, both engines were equipped with PermaTorque head gaskets from Fel-Pro.



**08** | All the fasteners on both engines, including the 12-point head bolts, came from ARP. Note that the 316's heads have been modified for screw-in rocker arm studs.



The engine pulled willingly from idle, and after some jetting adjustments, the little 306 made 419 horsepower and 362 lb-ft of torque breathing through air cleaners, exhaling through mufflers and we discovered we weren't getting full throttle—nonetheless we were happy. The engine idles smoothly and the throttle response is instantaneous.

Other than building something unique, we had modest horsepower and torque goals for our little naturally aspirated engine. We were shooting for

325 horsepower and as broad a torque curve as possible. Frankly, we just wanted it to be in the neighborhood of what a carbureted 5.3L LS would produce because that's the engine we were originally going to use in our latest hot rod but couldn't bring ourselves to go new school.

When the testing began we were concerned that with 1,025 cfm our little naturally aspirated engine would be way over-carbureted, but there was no indication that was the case. After changing the jets in the

center carburetor from 65s to 62s, and going from 70s to 68s in the end mixers we saw 338 horsepower and 349-lb ft of torque (with a 338 lb-ft average from 2,500 to 5,700 rpm). For giggles, we tested a carbureted LS1 and it produced 360.15 lb-ft of torque, but because our engine looks so much cooler, it doesn't bother us.

In the final analysis, both engines more than met our goals—good power; reasonable fuel consumption; and great, vintage visual appeal. Those are tales worth telling. **CHP**



**09** | Both engines were equipped with Comp Cams Ultra Pro roller rocker arms.



**10** | To cope with the pressure of supercharging, the 306 was equipped with ARP head studs.



**11** | Valves for the blown engine were 2.02-inch intakes and 1.60-inch exhausts from Comp Cams.



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**1981**

CH016



## A Tale of Two Chevys - Part 2



**12** | As a solid lifter cam was used in the blown engine, lash caps were used on the valve stems to protect them.



**13** | Establishing proper rocker arm geometry is essential. The tip of the rocker should sweep back and forth across the center of the valve stem.



**14** | Topping off John's engine is Weiland's new nostalgia supercharger kit. To keep the old vibe alive, the 1/2-inch toothed drivebelt and pulleys were used.



**15** | To seal the gaps between the block and manifold, beads of silicone were applied to the bulkheads.



**16** | The release point of the pop-off valve is established by adjusting the height of the springs to specs.



**17** | To maintain the nostalgic theme and have all the benefits of contemporary electronics, both engines were equipped with Flame-Thrower distributors from PerTronix.



**18** | Weiland's blower case, front snout, and swinging belt adjuster have the vintage look John was after. John fabricated the manifold holding a trio of Holley carburetors.

**19** | Here, John is mocking up the drive components—the blower will be underdriven 29 percent.



**20** | Weiland's new Tri-Power manifold is a medium-rise, dual-plane design that looks right at home on the 316.



**21** | Holley's Tri-Power setup uses a 325-cfm carburetor in the center and a 350-cfm version at each end. The progressive throttle linkage allows cruising on the center carburetor only.



**22** | At approximately two-thirds throttle, the outboard carburetors come into play, and all three reach wide open simultaneously.





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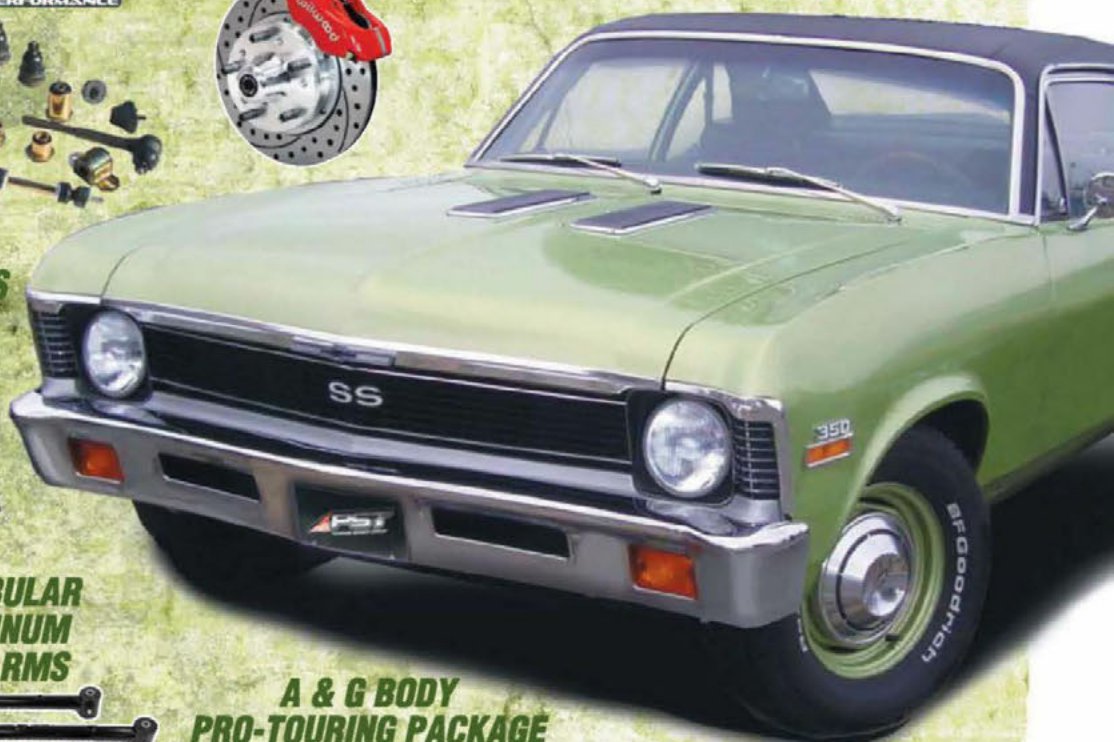
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## A Tale of Two Chevys - Part 2



**23** | Included in the Tri-Power kit are beautifully formed steel fuel lines. Note, only the center carburetor has a choke.

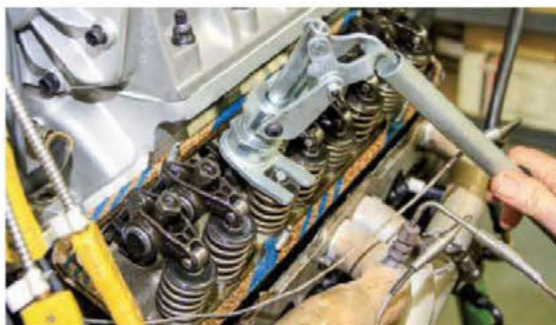


**24** | The PerTronix Ignitor III system includes an integral rev limiter that is easy to adjust (arrow). Note the screw slot and the plus and minus signs with an arrow.

**25** | For spark, both engines will rely on PerTronix Flame-Thrower III coils.



**26** | So there's no possibility of a cam failure during break-in, John removed the inner valvesprings.



**27** | After breaking in the cam, the inner springs were put back in place before making any full dyno pulls.



**28** | Our Tri-Power engine was broken in, then several pulls were made. Indications were some jet changes were in order.



**29** | The Tri-Power carbs have Holley's non-stick gaskets and use standard jets and power valves.

**30** | After a jetting change, these are the results of the final dyno pull made with the naturally aspirated Tri-Power small-block. Peak output was 338.6 horsepower at 5,600 rpm and 349.7 lb-ft of torque at 3,800 rpm.

John Beck Racing Engines  
631 country dr.  
chico ca. 95928  
530-892-9711

302 4A  
418  
302 418

Date: 09-20-2015 Time: 13:38:01

T13:37 D09-20 Engine Type: 283chev Carb: 1x2Molly  
Timing: 33 Jets: 62\*\*\* Bon Caridono Needs: stock  
281 with 337 crank cam/lyd roller \*\*\*62 45's  
\*\*\*Outboard carbs 70 to 62-66 \*\*\*Adjusted rev limit to 6000

Filename: 317ronC.D10  
Mode: A-Sweep

Speed rpm	C.TQ lbft	CPower hp	A/F Left	A/F Right	Oil psi	Fuel_P psi	Oil* psi	*F
2500	315.5	150.2	11.71	11.22	65.5	6.6	89	170
2600	318.5	157.7	11.77	11.09	66.1	6.6	89	170
2700	321	165	11.84	11.3	66.8	6.6	89	170
2800	322.2	172.4	11.86	11.26	67.3	6.6	89	170
2900	329.2	181.8	11.85	11.35	67.9	6.6	89	170
3000	334.7	191.2	11.93	11.47	68.6	6.6	89	170
3100	338.6	199.9	11.99	11.6	69.3	6.6	89	170
3200	342.4	208.6	12.02	11.63	69.9	6.6	89	170
3300	345.3	216.9	11.97	11.63	70.4	6.6	89	170
3400	346.9	224.6	11.83	11.6	71.1	6.6	89	170
3500	347.6	231.7	11.77	11.54	71.6	6.6	89	170
3600	348.5	238.9	11.63	11.49	72	6.6	89	170
3700	349.1	246.9	11.63	11.47	72.4	6.6	89	170
3800	349.7	253	11.68	11.49	72.9	6.6	89	170
3900	349.5	259.5	11.74	11.53	73.3	6.6	89	170
4000	348.6	265.5	11.74	11.57	73.5	6.6	89	170
4100	348.5	272.1	11.74	11.7	73.7	6.6	89	170
4200	349.3	279.3	11.81	11.88	74.1	6.6	89	170
4300	349.6	286.2	11.9	12.04	74.4	6.6	89	170
4400	349.1	292.4	11.96	12.1	74.9	6.6	89	170
4500	349.1	299.1	12.02	12.16	75.4	6.6	89	170
4600	349.2	305.8	12.12	12.2	75.9	6.6	89	170
4700	348.2	311.6	12.24	12.24	76.4	6.6	89	170
4800	346.3	314.5	12.28	12.26	76.3	6.6	89	170
4900	343.8	320.8	12.28	12.24	76.6	6.5	89	170
5000	340.7	324.4	12.3	12.23	77	6.6	89	170
5100	336.5	324.8	12.34	12.21	77.4	6.5	89	170
5200	332.9	329.6	12.38	12.23	77.7	6.5	89	171
5300	328.2	331.2	12.52	12.17	78.4	6.5	89	171
5400	324.5	333.7	12.37	12.16	77.6	6.5	89	171
5500	321.9	337.1	11.43	12.24	77.8	6.5	89	171
5600	317.6	338.6	11.45	12.18	77.4	6.5	89	171
5700	310.2	336.6	12.44	12.17	76.6	6.5	89	171

[ Average data ]  
4100 338 263.8 12 11.8 73.2 6.56 89 170.2  
[ Inertia factor ] .61 [ Time ] 8.2 Secs

**31** | The little 306 loved the top end of the tach. Hooked to a four-speed, this will be a fun engine in a lightweight hot rod. Peak output was 419.9 horsepower at 6,600 rpm and 362.1 lb-ft of torque at 5,500 rpm.

John Beck Racing Engines  
631 country dr.  
chico ca. 95928  
530-892-9711

Date: 11-16-2015 Time: 17:33:41  
INF-1.58 Mode: A-Sweep

T08:56 D07-36  
Timing: 30 1 Holley500's  
Fuel: pump 91  
Block power valve center carb  
\*Jets were 65 center 70 outer  
top pulley 38 to 36

Engine Type: blown 302\*chevy  
Customer: Boom Boom Jets: \*\*\*  
stainless muffs back on  
add air cleaners  
\*Now 62 center 73 outer

Filename: BOOMBOOM.D14

Speed rpm	C.TQ lbft	CPower hp	B/F2 psi	Oil lb/hp	Oil psi	Fuel_P psi	A/F Left	A/F Right
*4000	312.1	237.7	5	.524	75.9	4.6	13.69	13.66
*4100	315.8	246.5	6.2	.55	76	4.6	13.49	13.47
*4200	317.4	253.8	6.4	.53	76.2	4.6	13.42	13.39
*4300	324	265.3	6.6	.527	76.3	4.6	13.25	13.23
*4400	327.8	274.5	6.7	.526	76.5	4.6	13.14	13.12
*4500	332.8	285.1	6.9	.526	76.6	4.6	13.05	13.01
*4600	338.6	296.5	7	.53	76.6	4.6	12.91	12.87
*4700	342.7	306.7	7	.509	76.8	4.6	12.84	12.82
*4800	346.9	317.1	7	.508	76.8	4.5	12.73	12.71
*4900	351.3	327.7	7	.497	76.8	4.5	12.62	12.6
*5000	355.1	338	7.1	.506	76.7	4.5	12.46	12.4
*5100	356.7	346.4	7.1	.507	76.7	4.5	12.27	12.18
*5200	357.2	353.8	7.2	.523	76.6	4.5	12.1	11.99
*5300	358.6	361.8	7.3	.51	76.6	4.5	11.97	11.94
*5400	360.3	370.4	7.4	.513	76.6	4.4	11.82	11.69
*5500	362.1	379.3	7.6	.507	76.5	4.4	11.72	11.58
*5600	361.9	385.9	7.7	.514	76.2	4.3	11.66	11.51
*5700	361.8	392.7	7.8	.521	76	4.3	11.62	11.49
*5800	361.5	399.2	7.9	.529	75.6	4.3	11.56	11.43
*5900	361.1	405.6	8	.536	75.2	4.3	11.48	11.37
*6000	358.8	409.9	8.2	.546	74.9	4.3	11.39	11.3
*6100	356.3	413.9	8.3	.545	74.8	4.2	11.35	11.25
*6200	353.2	416.9	8.2	.55	74.5	4.2	11.29	11.21
*6300	349.8	419.6	8.3	.552	74.4	4.2	11.21	11.15
*6400	341.7	416.4	8.3	.569	74.1	4.2	11.26	11.18
*6500	336.7	416.8	8.3	.599	74	4.1	11.32	11.23
*6600	334.1	419.9	8.3	.596	74	4.2	11.33	11.24

Average data in \* band  
3300 349.84 350.32 7.4 .53 75.85 4.41 12.18 12.11



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CHANDLER, AZ**

**APRIL 1**

**RACE DAY 1**

**WILD HORSE PASS  
MOTORSPORTS PARK  
CHANDLER, AZ**

**APRIL 2**

**RACE DAY 2**

**TUCSON DRAGWAY  
TUCSON, AZ**

**APRIL 3**

**RACE DAY 3**

**WILD HORSE PASS  
MOTORSPORTS PARK  
CHANDLER, AZ**





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LG	62433/62428
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**6 TON HEAVY DUTY STEEL JACK STANDS**

**SAVE 50%**

LOT 69596  
61197/62393  
38847 shown

**Customer Rating**

**\$399**

comp at \$79.99

43650804

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**SUPER COUPON**

**MECHANIC'S SHOP TOWELS**

**PACK OF 50**

LOT 63031/46163  
61878/69649/61837

**SAVE 44%**

**\$999**

comp at \$18

43686286

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**18 PIECE SAE AND METRIC T-HANDLE BALL END HEX KEY SET**

**PITTSBURGH**

LOT 62476  
96645 shown

**Customer Rating**

**\$1212**

comp at \$24.97

43676003

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**10 FT. x 17 FT. PORTABLE GARAGE**

**SAVE \$131**

LOT 69039 shown  
60727/62286/62860  
62864/62859/63055

**Customer Rating**

**\$1799**

comp at \$311

43636706

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Limit 1 coupon per customer per day. Save 20% on any 1 item purchased. \*Cannot be used with other discount, coupon or any of the following items or brands: Inside Track Club membership, extended service plan, gift card, open box item, 3 day parking lot sale item, compressors, floor jacks, saw mills, storage cabinets, chests or carts, trailers, trenchers, welders, Admiral, CoverPro, Daytona, Diablo, Franklin, Hercules, Holt, Jupiter, Predator, Stik-Tek, StormCat, Union, Vanguard, Viking. Not valid on prior purchases. Non-transferable. Original coupon must be presented. Valid through 6/19/16.

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**WOW SUPER COUPON**

**2.5 HP, 10 GALLON, 125 PSI OIL LUBE AIR COMPRESSOR**

LOT 61490/67708/69092  
62441/62764/67708 shown

**SAVE \$39**

**\$1299**

comp at \$168.99

**Customer Rating**

**\$1599**

**\$1099**

comp at \$369.99

43667166

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**WOW SUPER COUPON**

**20 TON SHOP PRESS**

Customer Rating

LOT 32879  
60603 shown

• Pair of Arbor Plates Included

**SAVE \$210**

**\$1599**

**\$1099**

comp at \$369.99

43641337

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**SUPER COUPON**

**4-1/2" ANGLE GRINDER**

Customer Rating

LOT 60625 shown  
69645/95578

**\$1799**

**\$1499**

comp at \$29.97

**SAVE 59%**

43659908

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**SUPER COUPON**

**16" x 30" TWO SHELF STEEL SERVICE CART**

LOT 60390/5107 shown  
• 220 lb. capacity

**SAVE 39%**

**\$2999**

comp at \$49.98

43674657

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**SUPER COUPON**

**12,000 LB. ELECTRIC WINCH WITH REMOTE CONTROL AND AUTOMATIC BRAKE**

LOT 61256/60813  
61889/68142 shown

**SAVE \$453**

**\$2999**

comp at \$752.99

43642047

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**SUPER COUPON**

**27 LED PORTABLE WORKLIGHT/FLASHLIGHT**

LOT 67227 shown  
69567/60566/62532

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**SUPER COUPON**

**1/2" INDUSTRIAL QUALITY SUPER HIGH TORQUE IMPACT WRENCH**

• 700 ft. lbs. max. torque

LOT 62627  
68424 shown

**SAVE \$170**

**\$799**

comp at \$249.99

43662736

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**SUPER COUPON**

**LOW-PROFILE CREEPER**

Tools sold separately.

LOT 69262  
69094/61916  
2745 shown

**SAVE 75%**

**\$1999**

comp at \$79.99

43644854

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**SUPER COUPON**

**36" METAL BRAKE WITH STAND**

Customer Rating

LOT 62335/62518  
91012 shown

**SAVE \$60**

**\$1899**

comp at \$249.99

43697635

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## WOW SUPER COUPON

**Customer Rating**  
★★★★★

**44", 13 DRAWER INDUSTRIAL QUALITY ROLLER CABINET**  
US • GENERAL

LOT 68784 shown  
69387/62270/62744

- Weights 245 lbs.
- 2650 lb. capacity
- 14,200 cu. in. of storage
- 16" deep drawers have folded edges for extra strength and detents to secure the drawers when closing

**SAVE \$660** **\$369.99**  
comp at \$1029.99

**LIMIT 3** - Good at our stores or HarborFreight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Offer good while supplies last. Non-transferable. Original coupon must be presented. Valid through 6/19/16. Limit one coupon per customer per day.

## WOW SUPER COUPON

# FREE

WITH ANY PURCHASE

**CENTECH 7 FUNCTION DIGITAL MULTIMETER**  
LOT 90899 shown  
88025/69096

**\$15 VALUE**

**LIMIT 1** - Cannot be used with other discount, coupon or prior purchase. Coupon good at our stores, HarborFreight.com or by calling 800-423-2567. Offer good while supplies last. Shipping & Handling charges may apply if not picked up in-store. Non-transferable. Original coupon must be presented. Valid through 6/19/16. Limit one FREE GIFT coupon per customer per day.

## WOW SUPER COUPON

**2 PIECE VEHICLE WHEEL DOLLIES**  
• 1500 lb. capacity

LOT 60343  
67338 shown

**SAVE \$50** **\$49.99**  
comp at \$99.99

**LIMIT 3** - Good at our stores or HarborFreight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Offer good while supplies last. Non-transferable. Original coupon must be presented. Valid through 6/19/16. Limit one coupon per customer per day.

## WOW SUPER COUPON

**RAPID PUMP® 1.5 TON ALUMINUM RACING JACK**  
PITTSBURGH

**Customer Rating**  
★★★★★

**SAVE \$60**

- 3-1/2 Pumps Lifts Most Vehicles
- Weights 32 lbs.

LOT 69252  
68053/62160  
62496/62516  
60569 shown

**\$59.99**  
comp at \$119.99

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## WOW SUPER COUPON

**9 PIECE FULLY POLISHED COMBINATION WRENCH SETS**  
SAE  
LOT 69043/42304 shown  
METRIC  
LOT 42305/69044

**SAVE 66%**

**YOUR CHOICE \$5.99**  
comp at \$17.97

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## WOW SUPER COUPON

**AIR INLINE SANDER**  
LOT 91773/280  
62528 shown

**SAVE \$115** **\$24.99**  
comp at \$139.99

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## WOW SUPER COUPON

**1 TON CAPACITY FOLDABLE SHOP CRANE**  
PITTSBURGH

LOT 69445/93840  
61858/69512 shown

**SAVE \$169** **\$99.99**  
comp at \$269

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# THE DAR

Once a fake Yenko, this '68 emerged the super car it never was meant to be

❖ TEXT: **Chris Shelton** | PHOTOS: **Jorge Nunez**



## RIDES

➤ **The word Yenko** evokes a sort of glassy-eyed reverence among muscle car aficionados, even those who otherwise can't stand Chevrolets. The Pennsylvania dealer configured production cars for ultra-high performance—quite a statement for a time defined as the muscle car era. And the king of that heap were the 316 Camaros the dealer prepped from 1967 to 1969. A Yenko was the gun you brought to the knife fight.

Roy and Lisa Kampen bought a 1968 Yenko Camaro at a Toronto auction. Well, to be fair they bought a Yenko clone, but what beyond provenance is the difference between a faithful rendition and the real thing? A rose by any other name would smell just as sweet, and life was indeed sweet for the Kampens.





# K HORSE



You could call it exuberance that made Roy choose off against a friend's "ordinary" Mustang. But the sight of said pony galloping off into the distance sort of caused Roy's love for his supercar to wilt on the vine. "Something had to be done," he says.

The first step of his resolution was to transport the '68 to Hot Rods By Dean (HRBD) in Phoenix. We'll spare you the details of the teardown in lieu of the much more interesting rebuild.

The stock front clip remains but a Detroit Speed Inc. Speed Kit 3 replaces the steering and suspension components. It includes tubular arms, antiroll bar, and springs; however, this particular one has double-adjustable QA1 Proma Star coilovers and 2-inch dropped knuckles.

One of DSE's QUADRALink rear suspensions follows suit. It has the







9-inch-style housing with 4.11:1 gears on a Truetrac limited-slip carrier and 31-spline shafts. A set of DSE subframe connectors fortifies the body between the ends.

Big-block power is fine for going in a straight line but the weight it imposes on the nose sort of negates the benefits lavished on the new front suspension. So Roy went with LS 376 power. It's a combination that not only sheds a ton of weight by dint of its all-aluminum small-block construction but also churns out 489 lb-ft torque at 4,400 rpm and 525 hp at 6,300 rpm—figures that even GM's strongest 427s could only aspire to.

From front to back, the engine sports a Vintage Air Front Runner, a Spectre filter on a bespoke intake tube, and shorty-style Sanderson 1 5/8-inch-diameter headers. Those lead to a 2 1/2-inch-diameter exhaust system that passes a 4L70E automatic on its way back to 50-series Flowmasters. Transmission, Axle, and Driveline in Phoenix built the driveshaft.

The body remains largely stock. The only significant visible changes come from a stock-style Goodmark cowl-induction hood, Ringbrothers door handles, Eddie Motorsports hood hinges, and a 1969-style valance. But looks can be deceiving on such a low-contrast machine. Case in point, the bumpers, which HRBD narrowed, thinned, and tucked closer to the body. Oh yeah, and

the spoilers. The shop built those specifically for the car.

The DSE suspension makes a promise that the body can't quite keep, at least in the rear. A 5.5-inch backspace on 17x8 Schott Mach V wheels lets Nitto NT555 245/45s fit perfectly on the front. The same offset but on an 18x10 wheel with a 295/45 Nitto made the rear tire look perfectly centered at the opening, but it took a set of DSE mini tubs for the tire to squeeze into the wheelwell. With the majority of the metal prep work finished, Sean Rosic worked the body then Frank Gracia laid down the charcoal two-stage urethane.

The interior runs a Billet Specialties D-shaped Camber steering



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wheel atop an ididit column. A set of Auto Meter Carbon Fiber Ultra-Lite gauges mount in a Classic Dash insert. The HRBD crew installed a Vintage Air climate-control system, wired the car with an American Autowire harness, and built panels to install an elaborate JVC/Rockford Fosgate audio system.

From there Glenn Kramer at Hot Rod Interiors by Glenn in Glendale, Arizona, fabricated the center console, modified a pair of '00 Firebird seats, and trimmed everything in black and gray leather and suede.

Roy and Lisa Kampen's Camaro is a far cry from what it started as, even if that baseline was considerably higher than a muscle car. But in the end, what they got wasn't imaginable even a few years ago. "We wanted it to handle and perform like a Trans-Am racer yet still have all the comforts of a modern luxury sports coupe," Roy says. "Dean Livermore and crew at Hot Rods By Dean transformed the Camaro into the car we wanted all along."

The car may be done but Roy isn't quite finished. There's one last thing, a sort of score to settle with a certain Mustang. **CHP**

## TECH CHECK

**Owner:** Roy and Lisa Kampen, Alberta, Canada  
**Vehicle:** 1968 Camaro

### Engine

- **Type:** GM LS3
- **Displacement:** 376 ci
- **Compression Ratio:** 10.7:1
- **Bore:** 4.065 inches
- **Stroke:** 3.622 inches
- **Cylinder Heads:** L92-style with 68cc chambers
- **Valvetrain:** 2.165/1.590 valves, OEM roller rockers
- **Camshaft:** Chevrolet Performance hydraulic PN 88958770 (226/236-deg. duration at 0.050, 0.525/0.525-inch lift, 110-deg. LSA)
- **Induction:** Chevrolet Performance LS3 manifold, Spectre filter
- **Exhaust:** Sanderson 1 5/8-inch shorty to 2 1/2-inch pipes, 50-series Flowmaster mufflers
- **Ancillaries:** Narrowed Rock Valley stainless-steel fuel tank
- **Output:** 525 hp at 6,300 rpm, 489 lb-ft at 4,400 rpm

### Drivetrain

- **Transmission:** GM 4L70E
- **Driveshaft:** Transmission, Axle, and Driveline (Phoenix, AZ)
- **Rear Axle:** 9-inch-style housing, 4.11:1 gears, Truetrac limited-slip, Detroit Speed Inc. 31-spline axles

### Chassis

- **Steering:** Saginaw 600-style quick-ratio box
- **Front Suspension:** Detroit Speed Inc. control arms, springs, and 2-inch dropped knuckles. QA1 Proma Star double-adjustable dampers

- **Rear Suspension:** Detroit Speed Inc. QUADRALink, dampers, and subframe connectors
- **Brakes:** ABS electric-assist master cylinder with Wilwood 12.19-inch rotors and Dynalite four-piston calipers

### Wheels & Tires

- **Wheels:** Schott Mach V 17x8 front, 18x10 rear (5.5-inch backspace front and rear)
- **Tires:** Nitto NT555 245/45 front, 295/45 rear

### Interior

- **Seats:** 2000 Firebird modified by Glenn Kramer, Hot Rod Interiors (Glendale, AZ)
- **Upholstery:** Black and gray leather and suede by Glenn Kramer, Hot Rod Interiors
- **Instrumentation:** Classic Dash insert from Fast Lane West, Auto Meter Carbon Fiber Ultra-Lite gauges
- **Steering:** ididit column, Billet Specialties Camber wheel
- **Shifter:** Hurst Comp Stick handle on Lokar assembly
- **Wiring Harness:** American Autowire
- **HVAC:** Vintage Air
- **Audio:** JVC KW-V40BT head unit with Rockford Fosgate amplifiers and 5 1/4-inch (staging), 6x9-inch (fill), and 12-inch (subwoofer) by HRBD

### Exterior

- **Bodywork/Paint:** Sean Rosic (body), Frank Gracia (paint)
- **Hood:** Goodmark cowl-induction
- **Door Handles:** Ringbrothers
- **Hood Hinges:** Eddie Motorsports





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# LOSE WEIGHT AND GAIN STRENGTH

This bolt-in 1993-'02 F-body front suspension system has everything necessary for improved timeslips

♦ TEXT & PHOTOS: **Jim Smart**

**F**actory suspension systems have long been engineered to deliver a pleasant balance of handling and ride quality. But let's face it, you're not reading this article to learn how to take a smooth drive in the country. You're reading this to better understand drag racing suspension technology and how to get your 1993-'02 Camaro to steer safely and hook up for better timeslips.

How you do this depends both on budget and your expectations. When you're building a fourth-gen "slingshot" Camaro you don't have time or money to waste on suspension modifications that do not work. You want a suspension system that's going to work the first time. With drag racing, or any other kind of motorsport, the devil is in the details. Anything you can do to improve e.t.'s and speed, closes the gap. If you're running a 10-second Camaro it's always a good idea to get the most for your money now because you may not have it later.

Get used to the idea that racing isn't cheap. Cut corners and you're just

wasting time and money. The faster you want to go, the more expensive it becomes. Going fast is addictive. The faster you go the faster you're going to want to go. Be prepared to spend, but spend wisely and do it right the first time. Spending crazy money twice has never made sense, so listen up.

Begin your speed regiment with a plan. Never pick and choose suspension components all willy-nilly. Have a plan and know something about what you're buying. As car







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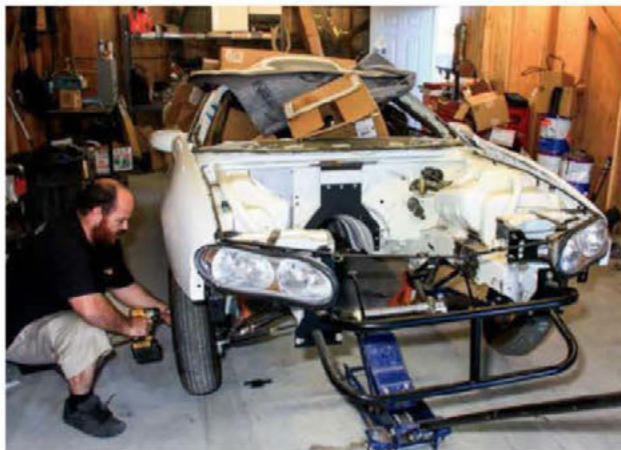


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## Lose Weight and Gain Strength

**01** | We're building a fully committed 2002 Camaro drag car—a rolling testbed to prove what works and what doesn't. We're placing our confidence in BMR Suspension with a complete lightweight bolt-in front K-member package that will include Strange four-piston disc brakes, coilover shocks, and rack-and-pinion steering.



**02** | This is BMR's KM001-1 K-member, devoid of engine mounts, and also designed for a standard rack. We like its lightweight design, ease of installation, and ability to adapt to any kind of street or track use. BMR's unique tubular K-member design features integrated frame stands that replace the factory cast-iron pieces. This weight reduction allows BMR to use larger diameter tubing and thicker mounting plates for added strength. When combined with BMR's upper (PN AA004, shown) and lower A-arms (PN AA002, not shown), a minimum weight reduction of 42 pounds is the drag racer's bonus.



**03** | We scored these upper spring mounts for our BMR front suspension swap. They have been media-blasted and treated to high-temperature satin black paint.



**04** | We've opted for AFCO coilover adjustable shocks (PN 3870F) because they work like a champ when it comes to good weight distribution. We're going to test an array of springs and document our results: 14-inch coilover, 275 lb rate; 14-inch coilover, 250 lb rate; 12-inch coilover, 150 lb. rate; and 12-inch coilover, 125 lb rate.

**05** | The Pinto-style rack-and-pinion has long been the industry standard when manual steering was required. However, the boilerplate Pinto rack doesn't always fit every application, nor does it always work well. On fourth-gen F-bodies, the Pinto-base rack causes excessive bumpsteer. The



overall distance between the inner tie rod pivot points should match the overall distance between the A-arm pivot points. Any variation to this will cause the tie rods and A-arms to swing on two separate arcs—causing toe changes as the suspension cycles up and down—otherwise known as bumpsteer. BMR's solution is to include a bumpsteer kit in their manual steering rack kit.

guys, we tend to get this backwards, by the way. We build incredible amounts of power into an expensive mill without first considering brakes and suspension, which should be the first thing we think of when building a Camaro drag car.

First, you must have a rock-solid platform that can handle the punishment of drag racing. Keep in mind that when you have flex or twist in the body or within the suspension, you will lose precious time. This is why you want adjustability in your chassis without suffering flex-inducing losses. You get rigidity from super-strong components made from 4340 chrome-moly steel. Adjustability comes from Heim joints in appropriate locations to where you can fine-tune chassis dynamics, and improve timeslips. The downside to rigidity is noise, vibration, and harshness. The stiffer you make the platform and suspension components, the more you sacrifice ride quality and increase road noise. This is less of a consideration for high-time drag racers, but it bothers some.

### THE BMR DIFFERENCE

BMR Suspension is a company that has been in business for about 20 years. They not only race and use what they engineer and develop, all their parts are manufactured right here in the USA. These folks cut, bend, notch, drill, and mill tubular components from American-made DOM and chrome-moly steel. Every product is fixture-welded to maintain consistent quality. Then they bead-blast and powdercoat parts on its own production line. Components are assembled and packaged in house to ensure the utmost quality control.

Our motivation to use BMR is its bolt-on demeanor smack in the factory locations. Simply remove the factory K-member and bolt this guy on. No welding or special modifications required.

We're satisfying our need for speed with a 2002 Camaro featuring brute LS power. To get there we need a lightweight bolt-in front suspension system that will not only keep our wild and crazy ship on course, but get us stopped safely when the fun is over. We're not only installing the BMR front suspension package, we plan to take it to the dragstrip and shake it down. We will keep you posted here in *Chevy High Performance* magazine and at [chevyhiperformance.com](http://chevyhiperformance.com). **CHP**





**06** | We've opted for the GM Pro Series front disc brake package from Strange Engineering. It includes black powdercoated four-piston fixed calipers with adjustment shims, hard metallic pads, one-piece forged 5-on-4.75 slotted rotors, spindle, and hub.



**07** | Assembly of the KM001-1 subframe begins with upper and lower control arms. These control arms are fabricated from heavy-duty 1.25-inch and 1.625-inch DOM tubing, including laser-cut, CNC-formed plate steel plate. Deflection is completely eliminated with these control arms. BMR's (PN AA032) upper and lower control arms arrive with new ball joints and greasable, super stiff 95-durometer bushings, which add a solid, more responsive feel over stock rubber bushings. BMR's bushings are internally fluted for better grease distribution.



**08** | Lower control arms, also known as A-arms, have adjustable Heim joints for caster adjustability.

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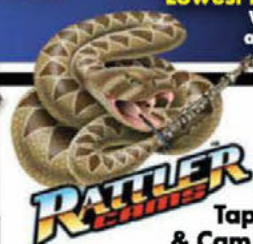
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## Lose Weight and Gain Strength



**09** | Ball joints, included with the upper control arms, are secured next. Don't forget to lube them prior to use. You'd be surprised how many of us forget to do this.



**10** | The manual steering rack is installed next. You get everything you need with the RK001 kit, which includes the rack, steering shaft with universal joints, mounting hardware, and bumpsteer kit. This rack and steering shaft are designed to clear headers with 2-inch primary tubes.



**11** | AFco coilovers are prepped for assembly with this adjustment ring and seat being first, then the springs. We're going to try a variety of springs and seat pressures to see what works best on the dragstrip.



**12** | Installation of the K-member is easy with either a floor jack or two healthy installers. We have installed the AFco coilover shocks, but will remove them during upper control arm installation for ease of access. Guess how we learned this one?





**13** | The K-member bolts to the framerails just like the factory crossmember. It is suggested you use a thread locker on the bolt threads for added security.



**14** | Notice how meaty the K-member is with its 1-5/8-inch x 0.120 wall and 1-1/4-inch x 0.095 wall DOM tubing. We like this piece for its lightweight construction and the fact that it's made in America.



**15-16** | We're installing the upper strut mount, which also accommodates the BMR upper control arm and AFCO coilover shock. We're using Grade 8 hardware on everything.

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**17** | Here's the installed K-member assembly, including the rack and upper and lower control arms. Too bad this nice powdercoated piece will be hidden from view by the engine and other suspension parts.



**18** | The BMR upper control arms are installed next, using provided hardware. Bolts are inserted from the inside out and tightened.



**19** | The AFCO coilovers are next and secured at the strut plate up top and to the BMR lower control arm down under.



**20** | The coilovers are secured as shown at the strut mount. AFCO and BMR make this process easy to do without special tools and coil spring compressors. Springs are adjusted once the engine and transmission are installed and the Camaro is on the ground. Ride height is adjusted once we get shakedown time.



**21** | The upper control arm pivot bolts are tightened and Heim joints checked for freedom of movement. The adjustable Heim joints are used to adjust both camber and caster.



**22** | Bumpsteer links are connected to the steering knuckles and secured. They will be adjusted once ride height is set. Adjustment takes place via these shims (arrow).



**23** | BMR provides this steering shaft fitted with two universal joints and couplings at each end. The steering column end is measured to the appropriate depth and marked. The hollow factory steering shaft will be marked and drilled for a 7/16-inch Grade 8 bolt.



**24** | The BMR steering shaft is secured at the rack as shown. It is suggested you use a thread locker on these Allen set screws, then tighten the nuts.





**25** | Factory disc brake caliper attachment points (arrows) have been removed to make room for the Strange four-piston caliper. The Strange caliper is a fixed piece and is adjustable using the provided shims.



**26** | The caliper bracket and hub are installed at this time. The bracket is bolted to the steering knuckle as shown and the hub is conventional with packed inner and outer wheel bearings. Spin the hub to seat bearings then tighten. Check for smooth operation then install the cage, cotter pin, and cap.



**27** | The one-piece Strange forged rotor is installed along with the four-piston caliper. This is a fixed caliper, which is adjustable via shims. You want the caliper centered on the rotor prior to pad installation. Once the pads are secured, install the retaining bolt and spacer. Brake hydraulics still has to be handled.

**28** | With the BMR/ AFCO/ Strange front suspension and brake package installed, we have shaved roughly 45 pounds off this front end, which is good news for the drag racer.



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# PARTS BIN

by Nick Licata



## Stylish Tachs

Classic Instruments has just released their all-new, 2 1/8-inch Full Sweep Tachometers. These tachs are available in a wide range of styles and feature push-button calibration, integrated red shift light (illuminates entire gauge), warning light, analog 0.5-4.5VDC output for data logging systems, and LED lighting (warm white or cool white). Classic Instruments is currently embarking on an extensive product line addition and will soon have these available across all series offered. For more information call **800.575.0461** or go to **classicinstruments.com**.



## Air Force LT1

If you're looking for bolt-on power and torque for your LT1, the new Atomic AirForce intake manifold from MSD is the answer. This all-new polymer intake will increase the performance of stock and modified versions of the direct-injected LT1 engine. The LT1 intake is a two-piece molded design, which allows for porting and runner modification, while the polymer construction minimizes weight and reduces heat absorption. MSD also makes it easy to accommodate power-adders by equipping the AirForce LT1 manifold with integral port fuel injection bosses at the base of each runner. Go to **msdperformance.com** or call them at **915.855.7123**.

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## Power Transfer

Centerforce recently released a new system for classic Chevy/GMC muscle. This fresh Centerforce II kit (PN KCFT713916) fits the 427ci 1966-'69 Corvette; the 400ci 1970 El Camino, Monte Carlo, Chevelle, Malibu, and Malibu SS. Street-friendly, the Centerforce II system comes complete and uses patented technologies to increase holding power while providing light pedal feel. For improved bite, the Centerforce II clutch disc uses premium organic friction material and incorporates a sprung hub design for progressive engagement and chatter-free performance. The Centerforce II kit comes ready to install with pressure plate, clutch disc, throwout bearing, alignment tool, pilot bearing, and pressure plate bolts. For more information visit **centerforce.com** or call **928.771.8422**.





## Autocross Auto Trans

► This new transmission package from TCI Automotive provides engine braking for GM 4L60E applications and includes a TCI EZ-TCU along with a paddle shifter. When driving in autocross, road racing, or off-road competitions, engine braking is a necessity. The TCI AUTO-X GM 4L60E Transmission Package offers crucial engine braking capability in First, Second, and Third gear when the shifter is placed in the Drive or Third-gear position. When the shifter is placed in the Overdrive position the transmission will operate with engine braking disabled. Users can employ a TCI converter featuring any stall or simply keep using their stock converter. More info is available at [tciauto.com](http://tciauto.com) or by calling **888.776.9824**.



## F-Body Suspension Kit

► Want better handling for your second-generation GM F-body? Turn to QA1's handling suspension kits for the best ride that fits your needs. Available in three different levels of performance, these handling kits offer easy, bolt-in installation. Not ready to make a full investment? Build your car in stages using QA1's parts list as a road map to get to the level of performance you want. These kits include spring rates carefully selected to maximize performance while maintaining a smooth, comfortable ride. Their level three handling kits offer stiffer springs to maximize cornering performance. These kits are also offered without shocks to give you the flexibility to order the shocks with the desired spring rates. For additional information, contact QA1 at **952.985.5675** or go to [qa1.net](http://qa1.net).



## Coolant Tester

► Phoenix Systems announces the launch of CoolantStrip, a new test strip that tests an engine's coolant fluid to determine when it's time to be replaced. CoolantStrip effectively measures the pH level and glycol percent of engine coolant. CoolantStrip can be used with all coolant colors, including conventional coolant as well as long life, extended life, Dex Cool, and Low Tox coolants. CoolantStrip joins BrakeStrip, a brake fluid testing strip, available from Phoenix Systems, to provide affordable, fast, and accurate fluid testing options. Call **866.760.5842** or go to [brakebleeder.com](http://brakebleeder.com) for more info.

## LS Cruise Control

► Dakota Digital announces a direct plug-in cruise control module for GM LS drive-by-wire engines. The CRC-1000 accepts CAN bus data and is compatible with any aftermarket control switch configuration and plugs directly into your OEM LS throttle pedal for simple installation and reliable operation and connectivity. The CRC-1000 obtains its information from the included diagnostic connector and throttle pedal connections, allowing an extremely simple installation for drive-by-wire GM CAN bus V-8 applications from 2006-current (and 2005 Corvette) models. Inputs for power, ground, and a connection to your existing brake light switch are all that is required. Additionally, an output is provided for a cruise-on indicator. More information can be obtained by calling Dakota Digital at **800.852.3228** or visiting [dakotadigital.com](http://dakotadigital.com).





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# JUST SAYIN

BY: Ro McGonegal



## From the Vault

More than 45 years have passed since this happened. The world was certainly a different place then. The cops had chased most of the hippies off Sunset Boulevard. Deep Throat was gurgling down on Santa Monica. Fuel was still cheap. Detroit muscle was at its pinnacle ... but beginning to droop like candles on a birthday cake. And Chevrolet had a problem: mediocre Camaro sales and the intricacies of a totally new car prompted the “Wizards of Warren” to deviate from the normal late-summer long-lead festivities and delay the introduction of the second-gen Camaro until February 13, 1970. The press rollout consumed a full day at the (now defunct) Riverside Raceway.

with the heinous Inland shifter. Evidently, someone heard the shrieks of thousands, so the second-gen Z28 had flawless Hurst linkage strapped to the close-ratio transmission.

But the Camaro had an Achilles heel that began to out long before it ever sniffed slick tires. The Monday after the Lions gig, the phone rang



Of the 112,323 units built, 8,733 were Z-cars. *Car Craft* got its hooks on a pre-production prototype and flaunted it weeks before the official release date. Even in car-jaded LA, the '70 1/2 Z28 rocked: Hugger Orange; big, black stripes; new all-forged, solid-lifter 360hp LT-1 engine; M21 four-speed; 4.10s; and a real snotty attitude (or maybe that was us).

A few years of Trans-Am racing had enlightened the suspension engineers. The new car had larger control arms that swept to the rear, improving the ball-joint angle and providing tastier caster and camber geometry. Instead of the standard 0.6875-inch unit, a 1.0-inch diameter bar led the way. At the rear, support came from five-leaf bundles (125-lb/in spring rate), staggered heavy-duty shocks, and a link-type stabilizer bar.

To soften the ride, the springs had a lower rate than the first-gen; shock absorber damping rates were increased accordingly and a rear antisway bar became standard equipment. But we were drag hags. We didn't care how well the new Camaro handled nor if it even had brakes. Nope. We wanted to burn rubber, bang gears, and listen to that engine ring. We needed a baseline. We called CJ (Hart) at Lions for some track time.

On the flatlands of Wilmington, we loosened the power steering belt and snatched the element from the twin-snorkel air cleaner can. It ran a best of 14.11 at 102.73. Earlier high-performance variations had been universally hobbled

funny. One of the guys was by the side of the road baking in a public booth watching the Z28's driveshaft twitching on the tarmac in the morning rays. The rear U-joint had sheared clean. Wah? We determined it a fluke. The car was so new that the dealer had to replace it with a part for a 1970 Chevelle. We forgot about it.

Chevrolet service bulletins advocated certain ancillaries for maximum performance. At the top of the list: tubular exhaust headers with equal-length primary pipes. Since there was nothing like that in the aftermarket, Hedman prototyped them on this Z28, putting up 1 3/4x30-inch primaries that merged into a 10x3-inch collector.

The remainder of the exhaust



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## ADVERTISING INDEX

AEROMOTIVE INC.	54
AIR FLOW RESEARCH CO.	13
ART MORRISON ENTERPRISES	41
AUTO METAL DIRECT	19
AUTO METER PRODUCTS INC.	33
AUTOMOTIVE RACING PRODUCTS	12
BRADFORD EXCHANGE	17
CLASSIC DASH	79
CLASSIC INDUSTRIES	29
CLASSIC PERFORMANCE PRODUCTS	14-15
COCKER TIRE	34
COMPETITION PRODUCTS	71
CORBEAU USA	9
DAKOTA DIGITAL	8
DANCHUK MANUFACTURING CO.	27
DETROIT SPEED ENGINEERING	51
DYNAMAT	45
EBC BRAKES USA INC.	37
EDDIE MOTORSPORTS	11
EDELBRÖCK	27
FAT MAN FABRICATIONS	49
FIREWHEEL CLASSICS	81
GROUND UP RESTORATIONS	47
HARBOR FREIGHT TOOLS	60-61
HOLLEY PERFORMANCE PRODUCTS	74
HONEST CHARLEY INC.	78
HOT RODS TO HELL	72
INLINE TUBE	48
J&W NOVA PARTS	78
LEGENDARY AUTO INTERIORS	81
LOKAR PERFORMANCE PRODUCTS	36
MAHLE MOTORSPORTS INC.	79
MARCH PERFORMANCE	81
MAST MOTORSPORTS	79
MUSCLE RODS	78
NATIONAL PARTS DEPOT	CV2
PERFORMANCE SUSPENSION TECHNOLOGY	57
PERTRONIX INC.	72
RAM AUTOMOTIVE	35
RHOADS LIFTERS	78
ROADSTER SHOP	3
ROCK AUTO LLC	47
SCOGGIN DICKEY PERFORMANCE PARTS	CV4
SEAN MURPHY INDUCTION	78
SPEED TECH PERFORMANCE/ATS	75
SPEEDWAY MOTORS	CV3
SUMMIT RACING	7
THERMO TEC	78
TMI PRODUCTS	69
TORQSTORM	75
TRICKFLOW	23
VIA MEDIC	78
WILWOOD ENGINEERING	25
YEAR ONE INC.	55

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system was original equipment, including the restrictive reverse-flow muffler and exhaust pipes that were flat on the bottom and then made some roller coaster curls and twists to fit where they were supposed to be. Further, the driveshaft tornado had whipped a serious crimp into one of them.

To amend the factory-lean air/fuel ratio, now exacerbated by the freer-flowing exhaust, we replaced the #70 primary jets with #73s but left the secondaries intact. We ran the valves hot: 0.024 on the intakes, 0.030-inch on the exhausts. We peeled out to Irwindale to have a look-see.

The Z had no fresh air intake, so we removed everything but the baseplate. The first pass was a high-16 as the engine ran out of air at 4,000 rpm in each gear. There was some sympathy going on underhood. The Holley carburetor was close enough to the insulation blanket to suck it down and choke the airflow. We put the snorkel top back on but left element out.

Remember those hinky leaf springs? We made some spring clips for the front of them to hold the main and second leaves and cinched the second and third leaves accordingly. The quickest and fastest pass of the day was 13.90 at 105.53. We tried to better it, of course, but on the next pass, the U-joint made like a hand grenade. We exhaled and traipsed over to the cheesy beer-and-burger bar across the street and dialed Clippinger Chevrolet in freeway-close Covina. The flatbed cometh.

Chevrolet engineers suggested the Jenkins/Lakewood slapper bars, but alas, there were none for this too-new



Chevy. Very soon, Lakewood's Joe Schubeck sent us the first pair off production. The Grump confirmed our suspicions about snubber height and clamp tightness and said to get some 8.90x15 (Goodyear) slicks and put 'em on 7-inch rims. Then we stopped by B&W Automotive in South Gate to see Dick Burley. He converted the vacuum-controlled, aluminum single-point distributor we'd brought along to full centrifugal advance.

Back at Irwindale, we made three passes in street trim for an average of 13.81/105.88. Open headers sliced the time to 13.60 and upped trap speed to 106.90. With the Goodyears at 12 psi, 6,000-rpm launches, and changing up at 6,100, the car ran 13.38/107.64. We pulled the AC43 plugs, found them lean and upped the primaries to #74s. We plopped in Burley's distributor with 16 crankshaft degrees of advance for a total of 50. The car averaged 13.22/107.73.

The jetting looked right but the engine needed more oats. We jacked

timing to 52 degrees and gained 0.08-second overall. Goodyear's bled to a scary 8 psi (the slicks weren't pinned to the wheels), the Z28 ran a best of 12.93/108.76.

A few months down the road we were informed that early cars had been fitted with too-soft front bushings that precipitated the spring deflection and the ensuing driveshaft shuck. As a running change that first year of production, GM retrofitted all Z28s with harder durometer bushings. The underside of the car was a right constellation, gashed and gouged like Beirut, like some dervish had gone absolutely ape with a fire ax and a ballpeen hammer.

Yeah, just another drag test back when drag tests really were.

Ro McGonegal began in this business back in 1968. He's been editor of *Car Craft*, *Hot Rod*, and *Chevy High Performance*. He's a wealth of old-school knowledge and his stories from "back in the day" are epic.

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### LS SHORT BLOCK ASSEMBLIES<sup>1</sup>

402ci, LS2 Block, 4.000" Stroke Assembly ..... Starting at \$4,995.87

#### Big Bull LS Short Blocks

"The Big Bull" LS Engine Short Block Assemblies feature the new SDPC 4340 forged steel 4.100" stroke crank, SDPC/Manley forged pistons, H-Beam 6.125" rods, and a new GM aluminum block.

Choose the size of Bull you can handle!  
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<sup>1</sup> Installation into 1997-2004 LS V8 cars and trucks will require an LS2 conversion kit.



**FREE Freight on all  
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all the time!<sup>2</sup>**

<sup>2</sup> Only to the 48 states. Restrictions apply.



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- Scat 6.125" H-Beam Rods
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The LS3 6.2L is the 430-hp standard engine in the Chevrolet Camaro. The LS3 crate engine comes complete, from the Camaro specific oil pan to the ignition system. It also includes the EFI intake manifold assembly with injectors and throttle body, exhaust manifolds, water pump, balancer, 58X reluctor wheel and 14-inch automatic-transmission flexplate. The aluminum block is filled with a sturdy reciprocating assembly that combines with L92-type rect.-port heads to deliver a 10.7:1 compression ratio. A high-lift, hydraulic roller camshaft delivers a whopping 0.551-inch of lift on the 2.16-inch intake valves and 0.522-inch lift on the 1.59-inch exhaust valves, enhancing the LS3's tremendous airflow and broad torque curve.



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Flows over 350 CFM out of the box!



- 350cfm of Intake Airflow!
- Combustion Chamber 70cc\*
- Intake Port Volume 279cc\*
- Minimum Cylinder Bore 4.000"

\* Approximate, Numbers are within +/- 2cc's

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SD5880-1.....	Stock Valves, 0.600" Lift.....	\$709.87 ea
SD8802-1.....	Manley Valves, 0.650" Lift.....	\$859.87 ea
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